

Glossário trilingüe (EN-PT-ES) de termos, abreviações e acrônimos usados com frequência em Imunologia. 2ª parte

Glosario trilingüe (EN-PT-ES) de términos, abreviaturas y siglas usados con frecuencia en inmunología. 2.ª parte

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No artigo anterior^a comentamos sobre a abrangência e o desenvolvimento da Imunologia, bem como demos alguns conceitos básicos sobre substâncias próprias e não-próprias, tolerância e antígenos. Vamos aqui abordar alguns conceitos sobre imunidade natural e imunidade adquirida, bem como sobre o elo de ligação entre esses dois tipos de imunidade, a inflamação.

Imunidade natural, inflamação e imunidade adquirida

Todos sabem que frente a uma epidemia, somente uma parcela da população em contato com o agente causal da epidemia fica de fato doente. Em geral, a maior parte da população embora tenha entrado em contato com o germe não desenvolve a doença, sendo pois resistente àquela doença. O que determina a **resistência** ou a **susceptibilidade** às infecções é a eficiência da resposta imunológica para um determinado microorganismo em particular. Assim, o mesmo indivíduo pode ser resistente a determinadas infecções e susceptível a outras. Em vertebrados, a resposta imunológica pode ser determinada por mecanismos inespecíficos, quando é chamada de imunidade natural, ou por mecanismos específicos, que compõem a imunidade adquirida.

A imunidade natural é obtida pela ação de células e moléculas com as quais as pessoas nascem (por isso é também designada imunidade inata), está potencialmente sempre presente e por isso constitui a primeira linha de defesa do organismo contra substâncias estranhas, estabelece-se rapidamente, tem pouca ou nenhuma especificidade para microorganismos; além disso, a resistência imediata não é duradoura e não aumenta pela repetição do estímulo antigênico.

Por outro lado, a imunidade adquirida (também chamada de imunidade adaptativa), é específica para o germe, a molécula ou a célula não-própria que a induziu, sendo pois uma resposta adaptativa ao não-próprio e apresenta **memória** (ou seja, o sistema imunológico se lembra de um encontro anterior com a molécula, célula ou micróbio, de forma que em encontros subsequentes estimula cada vez mais as defesas do organismo). As vacinações protetoras são baseadas no fenômeno da memória imunológica. Por exemplo, a vacinação contra varíola, difteria ou coqueluche (da mesma forma que a infecção por estas doenças) produz uma imunidade persistente e o desenvolvimento de linfócitos de memória, os quais induzirão por sua vez uma resposta imune mais eficaz, forte e duradoura após uma infecção ou vacinação posterior.

Tanto o sistema imunológico natural como específico consistem de várias moléculas, células e tecidos. As células mais importantes pertencem a duas grandes categorias: **fagócitos** e **linfócitos**.

Os principais componentes celulares da imunidade natural são os fagócitos e as **células citotóxicas naturais** (também conhecidas como células **NK**, do inglês *natural killers*); os fatores solúveis mediadores da imunidade natural mais importantes são: a lisozima, um complexo de substâncias genericamente designadas “sistema complemento” e as proteínas de fase aguda (como os **interferons** e a **proteína C-reativa**). Já os principais componentes responsáveis pela resposta imune adquirida são os linfócitos e os **anticorpos**, que são moléculas solúveis pertencentes à superfamília das imunoglobulinas (**moléculas de adesão**).

Quando as primeiras defesas naturais do organismo são rompidas, os mecanismos específicos de defesa entram em ação numa tentativa de erradicar o agente estranho. As respostas imunológicas específicas também amplificam os mecanismos protetores da imunidade natural, reforçando a capacidade do organismo em eliminar moléculas ou agentes antigênicos.

Imunidade natural

A maioria dos agentes infecciosos não consegue penetrar em nosso organismo graças a vários tipos de barreiras físicas e bioquímicas, tais como a pele íntegra, o muco, os cílios que revestem a traquéia, a acidez do estômago, a lisozima (uma proteína presente na saliva e secreções capaz de clivar as ligações das paredes celulares de determinadas bactérias), os organismos comensais existentes no sistema digestório e na vagina, o fluxo da urina (que arrasta os microrganismos) e seu pH ácido (que limita o crescimento das bactérias) entre várias outras barreiras naturais.

Quando um agente infeccioso consegue vencer estas primeiras barreiras e se instalar nos tecidos do hospedeiro, inicia-se uma reação inflamatória que propicia o influxo de um grande número de fagócitos para o local da infecção; esses fagócitos possuem potentes mecanismos microbicidas. Os fagócitos são capazes de englobar partículas, inclusive muitas espécies de bactérias e fungos, e de destruí-las. Este processo é denominado **fagocitose**. As principais células fagocitárias são os **neutrófilos**, os **monócitos** e os **macrófagos**.

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Além dos fagócitos as células citotóxicas naturais também desempenham importante papel na imunidade natural. Apesar de pertencer à linhagem de células linfocíticas, as células NK são consideradas elementos da imunidade natural por não atuarem de forma específica, nem desenvolverem memória, características de **linfócitos T e B**, mediadoras da imunidade adquirida. As células NK são leucócitos capazes de reconhecer alterações na superfície de células, como as que ocorrem em células tumorais e células infectadas por vírus. Nesses casos, as células NK conseguem se ligar às células alteradas e matá-las. Este tipo de reação na qual um linfócito mata uma célula alvo é denominado **citotoxicidade**.

Além das células fagocitárias e NK, determinadas substâncias solúveis também operam de forma coordenada, para erradicar agentes infecciosos. Isto inclui as proteínas de fase aguda, as proteínas do sistema complemento e os interferons, cujas concentrações geralmente aumentam rapidamente frente a infecções. Assim, por exemplo, as células NK têm papel fundamental no combate inicial das infecções virais, antes da atuação da imunidade específica, e parecem ser responsáveis pela rápida recuperação de resfriados comuns e de outras viroses de curta duração. As células NK são capazes de produzir o **interferon- γ** (IFN- γ), que ativa macrófagos, aumentando sua capacidade microbicida e tumoricidade, e inibe a replicação viral.

As proteínas de fase aguda compreendem, entre outras, a **proteína C-reativa**, capaz de se ligar a pneumococos e outras bactérias e promover a ativação de algumas proteínas do sistema complemento, a **lectina ligante de manose (MBL)**, capaz de facilitar a fagocitose de patógenos (por **opsonização**) que apresentam manose em suas superfícies e também ativam o sistema complemento pela via das lectinas, parte importante da imunidade natural.

O sistema complemento é um complexo formado por mais de 30 proteínas séricas cujas funções gerais são: opsonizar antígenos, facilitando assim a fagocitose; controlar a inflamação e destruir agentes estranhos pela lise celular. O sistema complemento interage com outros componentes do sistema imune natural e específico.

Interferons (IFNs) são um grupo de proteínas importantes na defesa contra infecções virais. O interferon- α e - β são produzidos por células infectadas por vírus e atuam em outras células para induzir um estado de resistência contra infecções virais. O IFN- γ , é produzido durante a fase de resposta imunológica adquirida específica.

Inflamação

Quando um tecido íntegro sofre uma agressão, seja de natureza infecciosa ou não, o tecido responde no sentido de restaurar a integridade perdida. No caso de agressão infecciosa, o microorganismo precisa ser eliminado para que a integridade possa ser restabelecida. A inflamação é, portanto, um mecanismo de defesa do organismo contra agressões, pois propicia o acúmulo e a ativação de células fagocitárias no local agredido, o que contribui para a eliminação dos microorganismos. É também essencial para a restauração dos tecidos, sendo que a cicatrização não ocorre sem inflamação. A inflamação

é também fundamental para o estabelecimento da resposta imunológica específica. Os microorganismos que não são destruídos no local, os antígenos dos microorganismos ou as células que fagocitaram os microorganismos são drenados pelos vasos linfáticos para o linfonodo mais próximo. Neste linfonodo reconhecem os antígenos devidamente processados e apresentados pelos macrófagos e outras **células apresentadoras de antígenos**, também designadas **APC** (do inglês, *antigen presenting cells*), o que é fundamental para o início da resposta imunológica específica. Esta se inicia, portanto nos linfonodos, neste caso, e/ou no baço, caso a infecção atinja o sistema circulatório. Como consequência são produzidos anticorpos e linfócitos ativados.

Imunidade adquirida

Quando um indivíduo é exposto a antígenos estranhos ocorre geralmente a estimulação de dois tipos básicos de mecanismos efetores. Um mediado por moléculas específicas, os anticorpos, presentes no sangue e em vários fluidos biológicos; tal tipo de resposta é designada **resposta humoral** e a imunidade mediada por anticorpos é a **imunidade humoral**. O outro tipo de resposta é efetuado por células, principalmente por linfócitos T e conferem a **imunidade mediada por células**.

A maioria das respostas imunológicas envolve interações entre a resposta humoral e celular. Ademais, os sistemas de imunidade natural e adaptativa não atuam de forma totalmente independente. Os exemplos a seguir podem ilustrar este fato: anticorpos podem não apenas neutralizar, mas também opsonizar os agentes infecciosos de forma que os fagócitos consigam reconhecer e englobar seus alvos de forma mais eficiente; linfócitos T ativados produzem certos hormônios designados citocinas e algumas dessas citocinas estimulam os fagócitos para destruir os agentes infecciosos de forma mais eficaz; os linfócitos T auxiliam ainda os linfócitos B a produzirem anticorpos.

Assim, o sistema imunológico atua como uma orquestra na qual todos os instrumentos são importantes, embora em algumas partes existam solos. O maestro dessa grande orquestra é o agente estranho que muitas vezes determina qual(is) o(s) tipo(s) de resposta a ser(em) desencadada(s) ou se haverá apenas o silêncio.

Na terceira e última parte desta série abordaremos alguns aspectos sobre as células e moléculas envolvidas na imunidade e como funcionam. Pretendemos, outrossim, dirigir algumas palavras sobre os efeitos deletérios que podem ocorrer em função da ativação do sistema imunológico.

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En el artículo anterior^a comentamos el desarrollo de la inmunología y ofrecimos algunos conceptos básicos sobre las sustancias propias y extrañas, la tolerancia y los antígenos. Vamos a abordar aquí algunos conceptos sobre la inmunidad natural y la inmunidad adquirida, así como sobre las conexiones que hay entre estos dos tipos de inmunidad, la inflamación.

Inmunidad natural, inflamación e inmunidad adquirida

Todos sabemos que en una epidemia sólo enferma una pequeña parte de la población que entra en contacto con el microorganismo causal. Lo que determina la **resistencia** o la **susceptibilidad** a las infecciones es la eficacia de la respuesta inmunitaria frente a un microorganismo en particular. De esta forma, el mismo sujeto puede ser resistente a determinadas infecciones y susceptible a otras. En los vertebrados, la respuesta inmunitaria está determinada por mecanismos inespecíficos —es lo que se llama inmunidad natural— o por mecanismos específicos —lo que se denomina inmunidad adquirida.

La inmunidad natural opera a través de células y moléculas con las que las personas nacen (por ello se denomina también *inmunidad innata*). Constituye la primera línea de defensa del organismo contra agentes extraños, se establece rápidamente, dura poco y no es específica del microorganismo; tampoco aumenta con la repetición del estímulo antigénico.

Por otro lado, la inmunidad adquirida (también llamada inmunidad adaptativa) es específica del microorganismo, la molécula o la célula extraña inductoras, por lo que constituye una respuesta adaptativa a lo ajeno y presenta **memoria** (es decir, el sistema inmunitario recuerda un encuentro anterior con una molécula, célula o microorganismo y los encuentros posteriores estimulan cada vez más las defensas contra ellos). Las vacunas se basan en el fenómeno de la memoria inmunitaria. Por ejemplo, una vacuna contra el sarampión, la difteria o la tos ferina (de la misma forma que las propias enfermedades) genera una inmunidad persistente con la aparición de linfocitos de memoria que inducirán a su vez una respuesta inmunitaria más eficaz, fuerte y duradera ante una infección o vacunación posterior.

Tanto el sistema inmunitario natural como el específico constan de componentes moleculares, celulares e históricos. Las células más importantes pertenecen a dos grandes categorías: los **fagocitos** y los **linfocitos**. Los principales componentes celulares de la inmunidad natural son los fagocitos y los **linfocitos citolíticos espontáneos** (también conocidos como **linfocitos NK**, del inglés *natural killers*); los factores solubles mediadores de la inmunidad natural más importantes son: la lisozima, un grupo de proteínas que actúa en cascada denominado *sistema del complemento* y las proteínas de fase aguda (como los **interferones** y la **proteína C-reactiva**). Los principales componentes responsables de la respuesta inmunitaria adquirida son los linfocitos y los **anticuerpos**, que son moléculas solubles pertenecientes a la superfamilia de las inmunoglobulinas (**moléculas de adhesión**).

Cuando se rompen las primeras defensas del organismo, entran en acción mecanismos específicos para erradicar el agente extraño. Las respuestas inmunitarias específicas también amplifican los mecanismos protectores de la inmunidad natural, lo que refuerza la capacidad del organismo de eliminar moléculas o sustancias antigénicas.

Inmunidad natural

La mayoría de los microorganismos infecciosos no consiguen penetrar en el organismo, gracias a varios tipos de barre-

ras físicas y bioquímicas, como la piel íntegra, las mucosas, los cilios que revisten la tráquea, la acidez gástrica, una lisozima (proteína presente en la saliva y las secreciones y capaz de lisar las uniones de las paredes celulares de determinadas bacterias), los microorganismos comensales existentes en el aparato digestivo y en la vagina, el flujo de orina (que arrastra los microorganismos) y el pH ácido (que limita el crecimiento de las bacterias), entre otras barreras naturales.

Cuando un microorganismo infeccioso consigue vencer estas primeras barreras y se instala en los tejidos del hospedador, se inicia una reacción inflamatoria que propicia la llegada de un gran número de fagocitos a la zona de la infección; estas células poseen mecanismos microbicidas potentes. Los fagocitos son capaces de englobar partículas, incluso muchas especies de bacterias y hongos, y de destruirlas. Este proceso se denomina **fagocitosis**. Las principales células fagocitarias son los **neutrófilos**, los **monocitos** y los **macrófagos**. Además de éstas, los **linfocitos citolíticos espontáneos** también desempeñan una función importante en la inmunidad natural. Aunque pertenecen a la línea de las células linfocíticas, las células NK se consideran elementos de la inmunidad natural porque no actúan de forma específica ni desarrollan memoria, características de los **linfocitos T y B**, los mediadores de la inmunidad adquirida. Los linfocitos NK son leucocitos que pueden reconocer alteraciones en la superficie de las células, como las presentes en las células tumorales y las infectadas por virus. En esos casos, los linfocitos NK pueden adherirse a las células alteradas y provocar su lisis. Este tipo de reacción en la que un linfocito mata a una célula se denomina **citotóxica**.

Además de las células fagocitarias y NK, determinadas sustancias solubles operan de forma coordinada para erradicar los microorganismos infecciosos. Entre ellas están las proteínas de fase aguda, las proteínas del sistema del complemento y los interferones, cuyas concentraciones aumentan generalmente con rapidez frente a las infecciones. Así, por ejemplo, los linfocitos NK desempeñan una función fundamental en las primeras etapas de las infecciones víricas, antes de la actuación de la inmunidad específica, y parecen ser responsables de la rápida recuperación en los resfriados comunes y otras infecciones víricas de corta duración. Los linfocitos NK son capaces de producir el **interferón γ** (IFN- γ), que activa los macrófagos, lo que aumenta su capacidad microbicida y tumoricida e inhibe la replicación vírica.

Las proteínas de fase aguda son, entre otras, la **proteína C-reactiva**, capaz de unirse a los neumococos y otras bacterias y de promover la activación de algunas proteínas del sistema del complemento, y la lectina de unión a manosa (**MBL**); ésta facilita (por **opsonización**) la fagocitosis de los microorganismos patógenos que presentan manosa en su superficie y activa el sistema del complemento por la vía de las lectinas, parte importante de la inmunidad natural.

El sistema del complemento es un complejo formado por más de treinta proteínas séricas cuyas funciones generales son opsonizar antígenos, facilitando así su fagocitosis, controlar la inflamación y destruir microorganismos extraños mediante lisis celular. El sistema del complemento interactúa con otros componentes del sistema inmunitario natural y específico.

Los interferones (IFN) son un grupo de proteínas importantes en la defensa contra las infecciones víricas. Los interferones α y β los producen células infectadas por virus y actúan en otras células para inducir un estado de resistencia contra las infecciones víricas. El IFN- γ se produce durante la fase de respuesta inmunitaria adquirida específica.

Inflamación

Cuando un tejido íntegro sufre una agresión, sea de naturaleza infecciosa o de otro tipo, el tejido responde en el sentido de restaurar la integridad perdida. En el caso de la agresión infecciosa, es preciso eliminar el microorganismo para restablecer la integridad. La inflamación es, por tanto, un mecanismo de defensa del organismo contra las agresiones, ya que propicia la acumulación y activación de células fagocitarias en la zona agredida, lo que contribuye a eliminar los microorganismos. Sin inflamación no hay cicatrización, lo que la hace fundamental para restaurar los tejidos. Asimismo, desempeña un papel decisivo en el establecimiento de la respuesta inmunitaria específica. Los microorganismos que no son destruidos, los antígenos de los microorganismos o las células que fagocitan a los microorganismos drenan por los vasos linfáticos hacia el ganglio linfático más próximo. Este ganglio linfático reconoce los antígenos debidamente procesados y presentados por los macrófagos y otras **células presentadoras de antígenos**, también llamadas **APC** (del inglés, *antigen presenting cells*), lo que es esencial para el inicio de la respuesta inmunitaria específica. Ésta comienza, por tanto, en los ganglios linfáticos, o en el bazo en caso de que la infección llegue al sistema circulatorio. Como resultado se producen anticuerpos y linfocitos activados.

Inmunidad adquirida

Cuando un sujeto se expone a antígenos extraños se activan generalmente dos tipos básicos de mecanismos efectores. Uno está mediado por moléculas específicas, los anticuerpos, presentes en la sangre y en diversos líquidos biológicos; este tipo de respuesta se denomina **respuesta humoral** y la inmunidad mediada por anticuerpos es la **inmunidad humoral**. El otro tipo de respuesta lo llevan a cabo células, principalmente los linfocitos T, y confiere **inmunidad celular**.

La mayoría de las respuestas inmunitarias conllevan interacciones entre la respuesta humoral y la celular. Además, los sistemas de la inmunidad natural y adaptativa no actúan de manera totalmente independiente. Los ejemplos que siguen ilustran este hecho: los anticuerpos pueden neutralizar los microorganismos infecciosos, pero sobre todo los opsonizan para que los fagocitos consigan reconocerlos y englobarlos de forma más eficaz; los linfocitos T activados producen ciertas hormonas llamadas **citocinas**, y algunas de ellas estimulan a los fagocitos para que destruyan los microorganismos infecciosos de forma más eficaz; los linfocitos T cooperan con los linfocitos B para que produzcan anticuerpos.

De esta forma, el sistema inmunitario actúa como una orquesta en la que todos los instrumentos son importantes, aunque en determinadas situaciones cada instrumento pueda actuar por separado. El director de esa gran orquesta y el agente extraño son los que determinan muchas veces el tipo de respuesta o respuestas desencadenadas o si habrá silencio.

En la tercera y última parte abordaremos algunos aspectos referentes a las células y las moléculas implicadas en la inmunidad y su funcionamiento. Asimismo, describiremos algunos de los efectos perjudiciales derivados de la activación del sistema inmunitario.

English	Definitions/ Definições/ Definiciones	Português e comentários	Español y comentarios
F1 or F ₁	<i>Abbrev. for first generation.</i>	F1 ou F ₁	F1 o F ₁ <i>Se mantiene generalmente el símbolo en inglés.</i>
F2 or F ₂	<i>Abbrev. for second generation.</i>	F2 ou F ₂	F2 o F ₂ <i>Se mantiene generalmente el símbolo en inglés.</i>
F(ab') ₂ fragment	Bivalent antigen-binding fragment obtained following pepsin digestion of immunoglobulin. Consists of both light chains and the N-terminal part of both heavy chains linked by disulfide bonds.	fragmento F(ab') ₂	fragmento F(ab') ₂
Fab fragment	Monovalent antigen-binding fragment of a partially digested antibody molecule (usually obtained following papain digestion). Consists of an intact light chain and the N-terminal heavy chain variable plus constant domains (V _H +C _H 1).	fragmento Fab	fragmento Fab

facultative intracellular organism	An organism that can, if necessary, grow within cells.	organismo intracelular facultativo	microorganismo intracelular facultativo
farmer's lung	A hypersensitivity pneumonitis caused by inhalation of organic dust from moldy hay containing some types of fungi spores The disease is caused by the interaction of IgG antibodies with large amounts of an inhaled allergen in the alveolar wall of the lung, causing alveolar wall inflammation and compromising gas exchange.	pulmão de fazendeiro	pulmón del granjero
FAS	A member of the TNF receptor gene family encoding FAS. Engagement of FAS (CD95) on the surface of the cell by the FAS ligand (CD178) present on cytotoxic cells can trigger apoptosis in the FAS-bearing target cell.	FAS	FAS
Fc fragment	Crystallizable, non-antigen binding fragment of an immunoglobulin molecule following papain digestion. Consists of the C-terminal halves of both heavy chains and is responsible for the biological activities of the molecule, through binding to Fc receptors and C1q (part of C1, the first complement component).	fragmento Fc	fragmento Fc
Fc receptor	A cell-surface receptor that specifically binds antibody molecules through their Fc region. They include the Fcγ and Fcε receptors	receptor para Fc	receptor de Fc
Fcγ receptor (FcγR)	A group of receptors including FcγRI, FcγRII and FcγRIII are cell surface receptors that bind the Fc portion of IgG molecules. Most Fcγ receptors bind only aggregated IgG, thus discriminating between bound and free antibody. They are expressed on phagocytes, B cells, NK cells and follicular dendritic cells. They have a role in humoral immunity, linking antibody binding to effector cell functions.	receptor para Fcγ	receptor de Fcγ
Fcε receptor (FcεR)	A receptor found mainly in mast cell basophils for the Fc region of IgE. When immune complexes bind to Fcε receptors, these cells may respond by releasing the mediators of immediate hypersensitivity, such as histamine and serotonin. There are two varieties of Fcε receptors, designated FcεRI and FcεRII (CD23). Fcε RI is a high-affinity receptor found on mast cells and basophils. FcεRII is a low-affinity receptor.	receptor para Fcε	receptor de Fcε
fibroblast	Connective tissue cell which produces collagen and plays an important part in wound healing.	fibroblasto	fibroblasto
first-set reaction	The initial rejection of a foreign tissue graft that occurs in 7-10 days after grafting caused by a primary immune response to a graft.	reação de primeira instância	rechazo agudo

FITC	<i>Acron. for fluorescein isothiocyanate.</i>	<i>Sigla para isotiocianato de fluoresceína.</i> <i>Geralmente é mantido como FITC, mas convém colocar o significado na primeira vez que o termo aparecer no texto.</i>	<i>Sigla de isotiocianato de fluoresceína.</i> <i>Se mantiene generalmente la sigla en inglés, aunque se aconseja explicar su significado la primera vez que aparece.</i>
fluorescein isothiocyanate (FITC)	Green fluorescent dye that can be conjugated to proteins (antigens or antibodies) for use in immunofluorescence reactions.	isotiocianato de fluoresceína (FITC)	isotiocianato de fluoresceína (FITC)
fluorescence-activated cell sorters (FACS)	Equipment used to count and separate leukocytes labeled with fluorescent-tagged antibodies to cell surface molecules. This is accomplished as single cells pass in a stream pass photodetectors. The analysis of single cells on this ways is called flow cytometry and the instruments that carry out the measurements and/or sort cells are called flow cytometers or cell sorters.	classificador de células ativadas por fluorescência	clasificador de células activado por fluorescencia
fluorescent antibody	An antibody chemically conjugated to a fluorescent dye, such as FITC.	anticorpo fluorescente	anticuerpo fluorescente
fluorochrome	Small fluorescent tag, such as fluorescein isothiocyanate and rhodamine, which allows for detection of antibodies or any other protein.	fluorocromo	fluorocromo
follicular dendritic cells	Dendritic cells within lymphoid follicles. These cells are crucial in selecting antigen-binding B cells during antibody responses. They have Fc receptors that are not internalized by receptor-mediated endocytosis and thus hold antigen-antibody complexes on their surface for long periods. Probably involved in the generation of antibody-secreting cells and maintenance of B-cell memory in germinal centers.	células foliculares dendríticas	células dendríticas foliculares
fragmentins	Enzymes in the granules of cytotoxic T cells and NK cells which induce apoptosis in the target cells. Also called granzymes.	fragmentinas (<i>ou</i> granzimas, <i>termo originado de grânulo + enzimas</i>)	fragmentinas (<i>o</i> granzimas <i>por</i> grânulo + enzimas)
framework region	The relatively conserved amino acid sequences which flank the hypervariable regions in immunoglobulin and T-cell receptor variable regions and maintain a common overall structure for all V-region domains.	região do arcabouço	región estructural
Freund's adjuvant	A very well known immunization adjuvant. It is an emulsion of water in mineral oil.	adjuvante de Freund	adyuvante de Freund
Freund's complete adjuvant	It is like Freund's adjuvant plus heat-killed <i>Mycobacteria</i> .	adjuvante de Freund completo	adyuvante completo de Freund
Fv fragment	A manufactured antibody fragment comprising a V region of a heavy chain and a V region of a light chain.	fragmento Fv	fragmento Fv

γ/δ T cells	T lymphocytes that express surface T cell receptors composed of γ and δ chains.	células T γ/δ	linfocitos T γ/δ
gamma globulins	A group of serum proteins that migrate toward the cathode on electrophoresis and includes most of the serum immunoglobulins.	gamaglobulinas	gammaglobulinas
gammopathy	Abnormality in gamma globulin production seen in various conditions of the immune system, but sometimes can be benign. It is a term equivalent to dysgammaglobulinemia	gamopatia	gammapatía
gel diffusion	An immunoprecipitation technique that involves letting antigen and antibody meet and precipitate in a clear gel such as agar. Used to evaluate the presence of antigens or antibodies in sera and other biological fluids.	difusão em gel <i>ou</i> imunodifusão em gel	difusión en gel <i>o</i> inmunodifusión en gel
gel filtration chromatography	A chromatographic procedure for the separation of a mixture of molecules on the basis of size. The stationary phase consists of porous beads with a well-defined range of pore sizes.	cromatografia por filtração em gel	cromatografía por filtración en gel
gene complex	A cluster of related genes occupying a restricted area of a chromosome.	complexo gênico	complejo génico
gene knock-out	The excision or inactivation of a gene within an intact organism or even animal (e.g., “knock-out mice”), usually carried out by a method involving homologous recombination.	gene nocauteado <i>ou</i> gene desativado	desactivación génica
gene rearrangement	Recombination of gene segments in the immunoglobulin and T-cell receptor loci, by intron deletions and exon junctions, to produce a functional variable region sequence, being therefore responsible for the specificity generation.	rearranjo gênico	reordenamiento génico
genetic immunization	A novel technique for inducing adaptive immune responses in which a plasmid DNA encoding a protein of interest is injected, usually into muscle; the protein is then expressed <i>in vivo</i> and cellular and humoral immune responses to the protein encoded by the DNA occur.	imunização genética	inmunización génica
genotype	The internally coded, inheritable information carried by all living organisms.	genótipo	genotipo
germinal center	Discrete areas within lymph nodes and spleen where B-cell maturation and immunological memory development occur. This area is rich in plasma cells, macrophages, B-cells, and follicular dendritic cells.	centro germinativo	centro germinal
germline configuration	Genes in their unrearranged state rather than those rearranged for production of immunoglobulin or TCR molecules.	configuração germinativa	configuración en línea germinal

giant cell	Large multinucleate cell derived from fused macrophages and often present in granulomas.	célula gigante	célula gigante
glomerulonephritis	A group of diseases characterized by renal glomerular capillary loops injuries, often resulting from immune complex depositions. Over 70% of glomerulonephritis patients have glomerular deposits of immunoglobulins, frequently with complement components.	glomerulonefrite	glomerulonefritis
GlyCAM-1	<i>Acron. for glycosylation-dependent cell adhesion molecule 1.</i>	GlyCAM-1 <i>Geralmente é mantido como Gly-CAM-1, mas convém colocar o significado na primeira vez que o termo aparecer no texto.</i>	GlyCAM-1 <i>Se mantiene generalmente la sigla en inglés, aunque se aconseja explicar su significado la primera vez que aparece.</i>
glycosylation-dependent cell adhesion molecule 1 (GlyCAM-1)	A mucin-like molecule found on the high endothelial venules of lymphoid tissues (except spleen). It is an important ligand for the L-selectin molecule expressed on naïve lymphocytes, directing these cells to leave the blood and enter the lymphoid tissues.	molécula 1 de adesão celular dependente da glicosilação	molécula 1 de adhesión celular dependiente de la glucosilación (GlyCAM-1)
Goodpasture's syndrome	A rapidly fatal autoimmune disease in which autoantibodies against basement membrane or type IV collagen are produced and cause extensive vasculitis.	síndrome de Goodpasture	síndrome de Goodpasture
gp	<i>Abbrev. for glycoprotein.</i>	gp <i>Abreviação para glicoproteína.</i>	gp <i>Símbolo de glucoproteína.</i>
graft-versus-host disease (GVHD)	The consequence of an immune reaction (graft versus host reaction) of transplanted allogeneic lymphocytes (usually contained in a bone marrow graft) against alloantigens of the recipient (host).	doença do enxerto versus hospedeiro	enfermedad del injerto contra el huésped (EICH)
graft-versus-host reaction (GVH)	The pathologic consequences of a response usually initiated when grafted T cells recognize and attack immunologically incompetent host cells. The host is unable to reject the grafted T cells and becomes their target.	reação enxerto versus hospedeiro (GVH)	reacción del injerto contra el huésped (ICH)
granulocyte	Any myeloid cell containing prominent cytoplasmic granules, including neutrophils, eosinophils and basophils.	granulócito	granulocito
granulocyte-macrophage colony- stimulating factor (GM-CSF)	A cytokine involved in the growth and differentiation of myeloid and monocytic lineage cells, including dendritic cells, monocytes and tissue macrophages, and cells of the granulocyte lineage.	fator estimulador de colônias de macrófagos e granulócitos	factor estimulante de colonias de granulocitos-macrófagos
granuloma	A localized nodular inflammatory lesion characterized by chronic inflammation with mononuclear cell infiltration and extensive fibrosis.	granuloma	granuloma

granzymes	See fragmentines.	granzimas	granzimas
Graves' disease	An autoimmune disease in which antibodies against the thyroid-stimulating hormone (TSH) receptor cause overproduction of thyroid hormone and thus hyperthyroidism.	doença de Graves ou bócio difuso tóxico	enfermedad de Graves
growth factors	Biologically active molecules that promote cell growth.	fatores de crescimento	factores de crecimiento
Guillain-Barré syndrome	A type of idiopathic polyneuritis in which autoimmunity to peripheral nerve myelin leads to a condition characterized by chronic demyelination of the spinal cord and peripheral nerves.	síndrome de Guillain-Barré ou polineurite aguda idiopática	síndrome de Guillain-Barré
gut-associated lymphoid tissue (GALT)	A lymphoid tissue which includes Peyer's patches, appendix, and solitary lymph nodes in the submucosa.	tecido linfóide associado ao trato intestinal	tejido linfático asociado al intestino (GALT) <i>Se mantiene generalmente la sigla en inglés, aunque se aconseja explicar su significado la primera vez que aparece.</i>
GVH	<i>Acron. for graft-versus-host [reaction].</i>	GVH <i>Sigla de reação enxerto versus hospedeiro. Geralmente é mantido como GVH, mas convém colocar o significado na primeira vez que o termo aparecer no texto.</i>	ICH <i>Sigla de reacción del injerto contra el huésped.</i>
GVHD	<i>Acron. for graft-versus-host disease.</i>	GVHD <i>Sigla de doença do enxerto versus hospedeiro. Geralmente é mantido como GVHD, mas convém colocar o significado na primeira vez que o termo aparecer no texto.</i>	EICH <i>Sigla de enfermedad del injerto contra el huésped.</i>
H-chain	<i>Abbrev. for heavy chain.</i>	cadeia H	cadena H
H-2 complex	The mouse major histocompatibility complex (MHC). Haplotypes are designated by a lower-case superscript, as in H-2 ^b .	complexo H-2 de histocompatibilidade	complejo H-2



haplotype	A particular combination of closely linked alleles on a chromosome. Since these alleles are genetically linked, they are usually inherited together. The term is commonly used in connection with the linked genes of the major histocompatibility complex (MHC), which are usually inherited as one haplotype from each parent. Some MHC haplotypes are over-represented in the population, a phenomenon known as linkage disequilibrium.	haplótipo	haplotipo
hapten	A small molecule that cannot initiate an immune response unless first bound to an immunogenic carrier molecule. Thus, although not immunogenic, it is able to react with an antibody of the appropriate specificity (elicited by immunization of the hapten + carrier molecule).	hapteno	hapteno
Hashimoto's thyroiditis	An autoimmune disease characterized by persistent high levels of antibody against thyroid-specific antigens. These antibodies recruit NK cells to the tissue, leading to damage and inflammation.	tireoidite de Hashimoto <i>ou</i> tireoidite auto-imune	tiroiditis de Hashimoto
heat-shock proteins (HSP)	A group of proteins produced under conditions of heat stress. These proteins help to stabilize other cellular proteins exposed to high temperatures. HSP help to protect cells under adverse conditions such as infection, inflammation, exposure to toxins, elevated temperature, injury, and disease. Heat shock proteins protect cells by blocking signals that tell cells to self-destruct through apoptosis.	proteínas de choque térmico (HSP)	proteínas de choque térmico (HSP)
heavy chain (H chain)	The larger of the two types of polypeptide chains in immunoglobulins, consisting of an antigen-binding portion having a variable amino acid sequence, and a constant region that defines the antibody class.	cadeia pesada <i>ou</i> cadeia H	cadena pesada (cadena H)
heavy-chain disease	A group of immunological disorders characterized by the presence of monoclonal but incomplete H chains without L chains in the sera and urine.	doença das cadeias pesadas	enfermedad de las cadenas pesadas



helper T lymphocytes <i>or</i> helper T cells (T _H)	The class of T lymphocytes whose primary function is to promote the activation and functions of other T cells, B cells, and macrophages. T helper cells are also called CD4+ cells and they help trigger B cells to make antibody against thymus-dependent antigens. Helper T cells also trigger the activation of effector cytotoxic T cells. These functions are mediated by releasing cytokines, such as interleukin-2, interleukin-4, interleukin-5, IFN-γ among others. There are three different T helper subsets: T _H 1, T _H 2 and T _H 3 and the most efficient helper T cells are the T _H 2 lymphocytes. The function of each of these subsets is determined by the cytokines they produce. Note that some CD4 T cells kill the cells they interact with, while some cytotoxic T cell do not need CD4 cells to differentiate into T cytotoxic lymphocytes. For more details refer to T _H 1 and T _H 2.	linfócitos T auxiliares (Th <i>ou</i> Taux)	linfocitos T cooperadores
hemagglutination	The agglutination of red blood cells, commonly by hemagglutinins.	hemaglutinação	hemaglutinación
hemagglutination inhibition	A technique to detect small amounts of antigen in which the agglutination of antigen bonded red cells is inhibited by homologous antigen.	inibição da hemaglutinação	inhibición de la hemaglutinación
hemagglutinin	Any substance (such as antibodies) that causes red blood cells to agglutinate. The hemagglutinins in human blood are the antibodies that recognize blood group antigens (such as those from the ABO blood group system). Influenza and some other viruses have hemagglutinin molecules that bind to glycoproteins on host cells to initiate the infectious process.	hemaglutinina	hemaglutinina
hematopoiesis	The production of blood cells of all types, including red blood cells, white blood cells and platelets.	hematopoese	hematopoyesis
hematopoietic stem cell	A bone marrow cell that is undifferentiated and serves as a precursor for multiple cell lineages. The differentiation of the hematopoietic stem cell into the different blood cells is under the influence of hematopoietic growth factors.	célula-tronco hematopoética	célula precursora hematopoyética
hematopoietic system	All cells and tissues responsible for the formation of blood cells.	sistema hematopoético	sistema hematopoyético
hemolymph	The fluid that fills the body cavities of invertebrates. It has analogous functions to blood.	hemolinfa	hemolinfa
hemolysin	Any substance, including antibody molecules, that can directly lyse or mediate complement triggered red blood cell lysis.	hemolisina	hemolisina

hemolytic disease of the newborn <i>or</i> erythroblastosis fetalis	Disease occurring as a result of the destruction of red blood cells by antibodies transferred from the mother to the fetus. Also called hemolytic disease of the newborn. Commonly due to maternal anti-Rh antibodies able to enter the fetus blood circulation.	doença hemolítica do recém-nascido (<i>e abreviada como DHRN</i>) <i>ou</i> eritroblastose fetal	enfermedad hemolítica del feto o el recién nacido (<i>o</i> eritroblastosis fetal)
hereditary angioedema	A disorder in which recurrent attacks of edema occur in the skin and gastrointestinal and respiratory tracts. It is due to decreased or absent C1 inhibitor (C1 INH). The most serious consequence of this disorder is epiglottal swelling leading to suffocation.	edema angioneurótico hereditário	edema angioneurótico
heterodimer	A molecule consisting of two different subunits closely joined. Examples include the T cell receptor comprised of either α and β chains or of γ and δ chains, and class I as well as class II histocompatibility molecules.	heterodímero	heterodímero
heterophile antigen	A cross-reacting antigen that appears in widely ranging species such as humans and bacteria.	antígeno heterófilo	antígeno heterófilo
high endothelial venules <i>or</i> high endothelial postcapillary venules	Post capillary venules lined with specialized cuboid epithelial cells that mediate specific binding and migration of blood lymphocytes into tissues.	vênulas pós-capilares de endotélio alto	vénulas poscapilares de endotelio alto
high-performance liquid chromatography (HPLC)	A chromatographic technique for separating proteins and other molecules using relatively high pressures and small diameter column packings to achieve sharp and highly reproducible elution profiles. Used to be called high pressure liquid chromatography.	cromatografia de alta eficiência de líquidos (HPLC)	cromatografía de líquidos de eficacia alta (HPLC)
high-zone tolerance	Tolerance induced by the injection of high antigen doses.	tolerância por dose alta	tolerancia por dosis alta
hinge region	A flexible region in the heavy chains of IgG and IgA molecules that permits the Fab arms to adopt a wide range of angles, permitting binding to epitopes spaced variable distances apart. It joins the Fab arms to the Fc piece.	região da dobradiça	región bisagra
histamine	A vasoactive peptide present in basophil and mastocyte granules which, after degranulation, acts as a mediator of inflammation causing increased vascular permeability and smooth muscle contraction. Histamine release produces some of the symptoms of immediate hypersensitivity reactions.	histamina	histamina
histiocyte	A tissue macrophage.	histiócito	histiocito

histocompatibility	A state of immunologic similarity (or identity) that permits successful homograft transplantation due to identity in all transplantation antigens. These antigens, in turn, are collectively referred as histocompatibility antigens.	histocompatibilidade	histocompatibilidade
histocompatibility antigens	Antigens on the surface of nucleated cells, particularly leucocytes and thrombocytes; these cell membrane proteins are required for antigen presentation to antigen sensitive cells.	antígenos de histocompatibilidade	antígenos de histocompatibilidade
HIV	<i>Acron. for human immunodeficiency virus.</i>	HIV <i>Sigla de vírus da imunodeficiência humana. Geralmente é mantido como HIV, mas convém colocar o significado na primeira vez que o termo aparecer no texto.</i>	VIH <i>Sigla de virus de la inmunodeficiencia humana.</i>
HLA	<i>Acron. for human leukocyte antigen.</i>	HLA <i>Sigla de antígeno leucocitário humano. Geralmente é mantido como HLA, mas convém colocar o significado na primeira vez que o termo aparecer no texto.</i>	HLA <i>Sigla de antígeno leucocitario humano. Se mantiene generalmente la sigla en inglés, aunque se aconseja explicar su significado la primera vez que aparece.</i>
homodimer	A molecule consisting of two identical subunits closely joined. Example, the antibody molecule has two L chains and two H chains, thus 2 homodimers.	homodímero	homodímero
homologous recombination	The exchange of sequence between two related but different DNA (or RNA) molecules, resulting a new “chimeric” molecule. Several mechanisms may result in recombination, but an essential requirement is the existence of a region of <i>homology</i> in the recombination partners. In DNA recombination, breakage of single strands of DNA in the two recombination partners is followed by joining of strands present in opposing molecules, and may involve specific enzymes. Recombination of RNA molecules may occur by other mechanisms.	recombinação homóloga	recombinación homóloga



HPLC	<i>Acron. for high-performance liquid chromatography.</i>	HPLC <i>Sigla de cromatografía líquida de alta eficiência.</i> <i>Geralmente é mantido como HPLC, mas convém colocar o significado na primeira vez que o termo aparecer no texto.</i>	HPLC <i>Sigla de cromatografía de líquidos de eficacia alta.</i> <i>Se mantiene generalmente la sigla en inglés, aunque se aconseja explicar su significado la primera vez que aparece.</i>
HSP	<i>Acron. for heat shock proteins.</i>	HSP <i>Sigla de proteínas de choque térmico.</i> <i>Geralmente é mantido como HSP, mas convém colocar o significado na primeira vez que o termo aparecer no texto.</i>	HSP <i>Sigla de proteínas del choque térmico.</i> <i>Se mantiene generalmente la sigla en inglés, aunque se aconseja explicar su significado la primera vez que aparece.</i>
human immunodeficiency virus (HIV)	Retrovirus that selectively infects human macrophages and CD4 ⁺ cells and causes AIDS. There are two major strains of the virus, HIV-1 and HIV-2; HIV-1 is the most disseminated worldwide while HIV-2 is endemic in West Africa but keeps spreading.	vírus da imunodeficiência humana (HIV)	virus de la inmunodeficiencia humana (VIH)
human leukocyte antigen (HLA)	The major histocompatibility antigens in humans; contains the genes coding for the polymorphic MHC class I and II class molecules and many other important genes.	antígeno leucocitário humano (HLA)	antígeno leucocitario humano (HLA)
humoral immunity	Immunity or immune responses that involve antibodies (in contrast with cell-mediated immunity: T-cell responses in the absence of antibody).	imunidade humoral	inmunidad humoral
hybridoma	An immortalized hybrid cell line formed by the fusion of a malignant cell (usually a myeloma cell) with a normal antibody-producing B lymphocyte. Therefore it has both the immortality of the tumor cell and the effector function (e.g. monoclonal antibody secretion) of the lymphocyte. The term is also used for a hybrid T cell resulting from the fusion of a T lymphocyte with a thymoma (a malignant T cell); the T-cell hybridoma proliferates continuously and secretes cytokines upon activation by antigen and APC.	hibridoma	hibridoma
hyperacute rejection	Rapid (minutes to hours) rejection of a graft mediated by preformed antibodies of the host reacting with the graft.	rejeição hiperaguda	rechazo hiperagudo



hyperimmune serum	Serum obtained from animals that have high level of immunity to a given antigen or groups of antigens, usually induced by repeated booster immunization to generate large amounts of functionally effective antibodies.	soro hiperimune	suero hiperinmunizador
hypersensitivity	State of reactivity to an antigen that is greater than normal; denotes a deleterious rather than a protective outcome. Hypersensitivity is classified into four types: type I, IgE-mediated; type II, antibody specific for a cellular antigen triggers the complement cascade; type III, antigen-antibody complexes deposit in tissues and activate complement; type IV, T-cell-mediated.	hipersensibilidade	hipersensibilidad
hypervariable regions	Small areas within immunoglobulin or TCR variable regions where the greatest variations in amino acid sequence occur. These are the small regions that make contact with the antigen and differs extensively from one receptor to the next.	regiões de hipervariabilidade	regiones hipervariables
hypogammaglobulinemia	An immunodeficiency in which low levels of all classes of immunoglobulins are found in blood.	hipogamaglobulinemia	hipogammaglobulinemia
I region	A segment of the H-2 chromosomic region where the mouse MHC class II antigen is located. It comprises the subregions I-A and I-E.	região I	región I
ICAM	<i>Acron. for</i> intercellular adhesion molecule.	ICAM <i>Sigla para</i> molécula de adesão intercelular. <i>Geralmente é mantido como ICAM, mas convém colocar o significado na primeira vez que o termo aparecer no texto.</i>	ICAM <i>Sigla de</i> molécula de adhesión intercelular. <i>Se mantiene generalmente la sigla en inglés, aunque se aconseja explicar su significado la primera vez que aparece.</i>
idiotope	An epitope formed by the variable amino acid sequences located in or close to the antigen binding site of an immunoglobulin.	idiotopo	idiótopo
idiotype	The unique collection of idiotopes on an immunoglobulin molecule. Idiotype of the immunoglobulin distinguishes it from all other immunoglobulins.	idiotipo	idiotipo
idiotype networks	The series of reactions between idiotopes, anti-idiotopes and anti-anti-idiotopes that plays a role in controlling immune responses.	rede idiotípica	red idiotípica

IFN	<i>Abbrev. for</i> interferon.	IFN <i>Abreviação para</i> interferon.	IFN <i>Símbolo de</i> interferón.
IFN- α	<i>Abbrev. for</i> interferon alpha <i>or</i> interferon α .	IFN- α <i>Abreviação para</i> interferon- α .	IFN- α <i>Símbolo de</i> interferón α .
IFN- β	<i>Abbrev. for</i> interferon beta <i>or</i> interferon β .	IFN- β <i>Abreviação para</i> interferon- β .	IFN- β <i>Símbolo de</i> interferón β .
IFN- γ	<i>Abbrev. for</i> interferon gamma <i>or</i> interferon γ	IFN- γ <i>Abreviação para</i> interferon- γ .	IFN- γ <i>Símbolo de</i> interferón γ .
Ig	<i>Abbrev. for</i> immunoglobulin.	Ig <i>Abreviação para</i> imunoglobulina.	Ig <i>Símbolo de</i> imunoglobulina.
IgA	<i>Abbrev. for</i> immunoglobulin A.	IgA <i>Sigla de</i> imunoglobulina A.	IgA <i>Símbolo de</i> imunoglobulina A.
IgD	<i>Abbrev. for</i> immunoglobulin D.	IgD <i>Sigla de</i> imunoglobulina D.	IgD <i>Símbolo de</i> imunoglobulina D.
IgE	<i>Abbrev. for</i> immunoglobulin E.	IgE <i>Sigla de</i> imunoglobulina E.	IgE <i>Símbolo de</i> imunoglobulina E.
IgG	<i>Abbrev. for</i> immunoglobulin G.	IgG <i>Sigla de</i> imunoglobulina G.	IgG <i>Símbolo de</i> imunoglobulina G.
IgM	<i>Abbrev. for</i> immunoglobulin M.	IgM <i>Sigla de</i> imunoglobulina M.	IgM <i>Símbolo de</i> imunoglobulina M.
IL	<i>Abbrev. for</i> interleukin.	IL <i>Abreviação para</i> interleucina.	IL <i>Símbolo de</i> interleucina.
immediate (type I) hypersensitivity	<i>See</i> allergy.	hipersensibilidade imediatea <i>ou</i> hipersensibilidade tipo I	hipersensibilidad inmediata (del tipo I)
immune adherence	The adherence of particulate antigen coated with C3b to tissue having cells with C3b receptors.	imunoaderência	inmunoaderencia
immune clearance	<i>See</i> immune elimination.	eliminação imunológica	eliminación inmunitaria
immune complex	Complex of antibody bound to antigen which may also contain complement components.	complexo imune	inmunocomplejo

immune elimination (<i>or</i> immune clearance)	The enhanced removal of an antigen from the bloodstream by circulating antibodies and phagocytic cells.	eliminação imunológica	eliminación inmunitaria
immune response (Ir) gene	A gene controlling the immune response to a particular antigen; most genes of this type are in the MHC (major histocompatibility complex), and the term is rarely used to describe other types of Ir genes outside the MHC.	gene de resposta imune <i>ou</i> gene Ir	gen de respuesta inmunitaria
immune surveillance	The capacity of the immune system to continually recognize and remove malignant cells that arise during one's life.	vigilância imunológica	vigilancia inmunitaria
immunoabsorption	A method for removal of antibody or antigen by allowing it to bind to solid phase antigen or antibody.	imunoabsorção	inmunoabsorción
immunoblot(ing) <i>or</i> Western blot	A common technique for analyzing and identifying protein antigens: the proteins are separated by electrophoresis in polyacrylamide gel, then transferred ("blotted") onto a nylon, nitrocellulose membrane or treated paper, usually by applying a current, where they bind in the same pattern as they formed in the gel. The reactions are revealed by the binding of specific labeled antibodies.	imunoeletrotransferência <i>ou</i> <i>Western blot</i>	imunoelectrotransferencia <i>o</i> <i>Western blot</i> <i>En español suele utilizarse el término inglés.</i>
immunodot	<i>See</i> dot-blot.	<i>dot-blot</i> <i>ou</i> imunotransferência por pontos	inmunotransferencia por puntos <i>o</i> <i>immunodot</i> . <i>En español suele utilizarse el término inglés.</i>
immunodeficiency	Disease condition in which immune function is defective.	imunodeficiência	inmunodeficiencia
immuno-electrophoresis	A technique involving electrophoresis to separate protein from a mixture followed by immunodiffusion; it is used to identify the proteins in a complex solution such as serum.	imuno-eletróforese	inmuno-electroforesis
immunofluorescence method	Any method in which a fluorescent-labeled antibody (or antigen) is used to detect the presence or determine the location of the corresponding antigen (or antibody). This is usually performed by one of two methods: <i>direct</i> , in which immunoglobulin (antibody) conjugated with a fluorescent dye is added to tissue and combines with specific antigen (microbe, or other), the resulting antigen-antibody complex being located by fluorescence microscopy, or <i>indirect</i> , in which unlabeled immunoglobulin (antibody) is added to tissue and combines with specific antigen, after which the antigen-antibody complex may be labeled with fluorescein-conjugated anti-immunoglobulin antibody, the resulting triple complex then being located by fluorescence microscopy.	imunofluorescência	inmunofluorescencia

immunogen	Any substance which elicits an immune response. Although all immunogens are antigens, not all antigens are immunogens (<i>see</i> haptens for antigens that are not immunogens).	imunógeno	inmunógeno
immunogenicity	The state or property of eliciting an immune response.	imunogenicidade	inmunogenicidad
immunoglobulin	A class of structurally related proteins, each consisting of two pairs of polypeptide chains, one pair of light (L) [low molecular weight] chains (2 or 3), and one pair of heavy (H) chains (+ and -), all four linked together by disulfide bonds. On the basis of the structural and antigenic properties of the H chains, immunoglobulins (Ig) are classified (in order of relative amounts present in normal human serum) as IgG (7 S in size, 80%), IgA (10 to 15%), IgM (19 S, a pentamer of the basic unit, 5 to 10%), IgD (less than 0.1%), and IgE (less than 0.01%). All of these classes are homogeneous and susceptible to amino acid sequence analysis. Each class of H chain can associate with either 2 or 3 L chains. Subclasses of Ig, based on differences in the H chains, are referred to as IgG1, etc. Antibodies are Ig, and most Ig probably function as antibodies. However, Ig refers not only to the usual antibodies, but also to a great number of pathological proteins classified as myeloma proteins, which appear in multiple myeloma along with Bence-Jones proteins, myeloma globulins, and Ig fragments.	imunoglobulina	inmunoglobulina
immunoglobulin A	The predominant immunoglobulin in secretions (e.g., saliva).	imunoglobulina A	inmunoglobulina A
immunoglobulin D	An immunoglobulin class present in the surfaces of B cells.	imunoglobulina D	inmunoglobulina D
immunoglobulin E	The immunoglobulin class that is the predominant mediator of immediate hypersensitivity reactions (allergies).	imunoglobulina E	inmunoglobulina E
immunoglobulin G	The predominant immunoglobulin class produced during secondary immune responses. The most conspicuous immunoglobulin in the blood.	imunoglobulina G	inmunoglobulina G
immunoglobulin M	The predominant immunoglobulin class expressed by virgin B lymphocytes and secreted during primary immune responses.	imunoglobulina M	inmunoglobulina M
immunoglobulin superfamily	A large family of proteins involved in cellular recognition and interaction that are structurally and genetically related to immunoglobulins. They are characterized by possession of 'immunoglobulin-type' domains of approximately 110 amino acids folded into two β -pleated sheets. Members include immunoglobulins, T-cell receptors and MHC molecules.	superfamília das imunoglobulinas	superfamilia de inmunoglobulinas

immunological ignorance	A form of self-tolerance in which reactive lymphocytes and their target antigen are both detectable within an individual, yet no autoimmune attack occurs.	ignorância imunológica	indiferencia inmunitaria
immunological memory	A characteristic of the acquired immune response of lymphocytes whereby a second encounter with a given antigen produces a secondary immune response, which is faster, greater and longer lasting than the first (primary) immune response.	memória imunológica	memoria inmunitaria
immunoperoxidase test <i>or</i> technique	Immunologic test that uses antibodies chemically conjugated to the enzyme peroxidasa.	prova de imunoperoxidase	prueba <i>o</i> técnica de la inmunoperoxidasa
immunoreceptor tyrosine-based activation motif (ITAM)	A pattern of amino acids in the cytoplasmic tail of many transmembrane receptor molecules, including Ig α and Ig β and CD3 chains, which are phosphorylated and then associate with intracellular molecules as an early consequence of cell activation.	motivo tirosínico de ativação dos receptores imunológicos (ITAM)	estructura tirosínica activadora de los inmunorreceptores (ITAM).
immunoreceptor tyrosine-based inhibition motif (ITIM)	A pattern of amino acids in the cytoplasmic tail of transmembrane molecules, such as CD32, which negatively regulates cell activation The ITIM bonds a phosphatase which removes phosphate groups from tyrosine residues in the ITAMs of other membrane molecules.	motivo tirosínico de inibição dos receptores imunológicos (ITIM)	estructura tirosínica inhibidora de los inmunorreceptores (ITIM)
immunosuppression	Inhibition or elimination of the immune responses by drugs or other processes.	imunossupressão	inmunosupresión
inactivated vaccine	A vaccine containing a pathogen that has been treated in such a way that either is no longer capable of replication or is killed.	vacina inativada	vacuna inactivada
incomplete antibody	An antibody that can bind to a particulate antigen but is incapable of causing its agglutination.	anticorpo incompleto	anticuerpo incompleto
inflammation	The complex series of responses of tissues to trauma. It is characterized by increased blood flow and entry of leukocytes into the injured tissues, resulting in swollness, redness, elevated temperature and many times pain. These responses generally act to enhance tissue defenses and initiate repair processes.	inflamação	inflamación
innate immunity	The antigen-nonspecific mechanisms involved in the early phase of resistance to a pathogen, which include phagocytic cells, cytokines, and complement; it is not expanded by repeat stimulation with the pathogen. Include all aspects of immunity not directly mediated by lymphocytes.	imunidade natural <i>ou</i> imunidade inata	inmunidad innata
integrins	A family of adhesion proteins found on cell membranes that binds to connective tissue proteins such as collagen or fibronectine.	integrinas	integrinas

intercellular adhesion molecules (ICAM)	Adhesion molecules that interact with integrins on the surface of several cell types, including antigen-presenting cells and T cells. They are important for the contact of T lymphocytes and antigen-presenting cells. There are three different molecules: ICAM-1, ICAM-2, and ICAM-3; all them are members of the immunoglobulin superfamily.	moléculas de adesão intercelular (ICAM)	moléculas de adhesión intercelular (ICAM)
interferon (IFN)	A group of cytokines having antiviral activity and capable of enhancing and modifying the immune response. IFN- α and - β are also called leukocyte IFN. IFN- γ is the immune IFN.	interferon (IFN)	interferón (IFN)
interferon- α	A cytokine produced mainly by leukocytes in response to virus infection that interferes with virus replication.	interferon- α	interferón α
interferon- β	Cytokine produced mainly by fibroblasts in response to virus infection that interferes with virus replication.	interferon- β	interferón β
interferon- γ	A cytokine produced by T cells, specially T _H 1, CD8 cells and NK cells, that signals APC to be activated and to express more membrane MHC.	interferon- γ	interferón γ
interleukin (IL)	Cytokine secreted by leukocytes that act as growth, differentiation and function factors for the cells of the immune system. As there are more than 30 ILs defined to the moment, we will list below only a few we consider the most known/defined ones.	interleucina (IL)	interleucina (IL)
interleukin-1 (IL-1)	A cytokine, derived primarily from macrophages and epithelial cells, which enhances the proliferation of T helper cells and growth and differentiation of B cells. When secreted in larger quantities, IL-1 enters in the bloodstream and can cause fever, induce synthesis of acute phase proteins, and initiate metabolic wasting. There are two distinct forms of IL-1: alpha and beta, both of which perform the same functions, but represent different proteins.	interleucina-1	interleucina 1
interleukin-2 (IL-2)	A cytokine derived mainly from T _H 1 lymphocytes that causes proliferation of T lymphocytes and activated B lymphocytes. <i>Syn.</i> : T-cell growth factor.	interleucina-2	interleucina 2
interleukin-3 (IL-3)	A lymphokine, released by helper T cells and thymic epithelial cells in response to an antigen or mitogen, that stimulates the growth of blood stem cells and lymphoid cells such as macrophages and mast cells. <i>Syn.</i> : multiclonal CSF.	interleucina-3	interleucina 3

interleukin-4 (IL-4)	A cytokine derived mainly from T _H 2 lymphocytes that causes differentiation of B lymphocytes. And other cell types. It is a costimulator of DNA-synthesis. It induces the expression of class II MHC molecules on resting B-cells. It enhances both secretion and cell surface expression of IgE and IgG1. It also regulates the expression of the low affinity Fc receptor for IgE (CD23) on both lymphocytes and monocytes. <i>Syn.</i> : B-cell stimulatory factor 1; (BSF-1); B-cell growth factor 1 (BCGF-1).	interleucina-4	interleucina 4
interleukin-5 (IL-5)	A cytokine derived from mainly from T _H 2 lymphocytes that causes activation of B lymphocytes and growth and differentiation of eosinophils. <i>Syn.</i> : B-cell growth factor 2 (BCGF-2).	interleucina-5	interleucina 5
interleukin-6 (IL-6)	A cytokine derived from fibroblasts, activated macrophages, activated T cells and endothelial cells. IL-6 has a wide variety of biological functions: it plays an essential role in the final differentiation of B-cells into Ig-secreting cells and T-cell growth. It induces nerve cells differentiation and acute phase reactants in hepatocytes; and causes fever. <i>Syn.</i> : B-cell stimulatory factor 2 (BSF-2), interferon- γ ; B-cell differentiation factor (BCDF).	interleucina-6	interleucina 6
interleukin-7 (IL-7)	A cytokine derived from bone marrow cells that causes proliferation of B and T lymphocytes.	interleucina-7	interleucina 7
interleukin-8 (IL-8)	A cytokine derived from endothelial cells, fibroblasts, keratinocytes, macrophages, and monocytes which causes chemotaxis of neutrophils, basophils and T cells. <i>Syn.</i> : neutrophil chemotactant factor.	interleucina-8	interleucina 8
interleukin-9 (IL-9)	A cytokine derived from T cells which causes growth and proliferation of T _H 2 cells.	interleucina-9	interleucina 9
interleukin-10 (IL-10)	A cytokine derived from T helper lymphocytes, EBV-transformed B cells, and monocytes that inhibits IFN secretion by T lymphocytes and inhibits macrophages functions. <i>Syn.</i> : cytokine synthesis inhibitory factor.	interleucina-10	interleucina 10



interleukin-12 (IL-12)	A cytokine derived from B lymphocytes, activated T _H 1 lymphocytes, macrophages and dendritic cells that induces gamma-interferon (IFN γ) gene expression in T lymphocytes and NK cells. It is also a natural endogenous inhibitor of T _H 2-type responses. <i>Syn.</i> : NK cell stimulating factor.	interleucina-12	interleucina 12
interleukin-13 (IL-13)	A cytokine derived mainly from T _H 2 lymphocytes that helps in the B-cell growth and differentiation, inhibits mononuclear cells inflammatory cytokine production and T _H 1 cells, and mediates allergic and asthmatic reactions.	interleucina-13	interleucina 13
interleukin-15 (IL-15)	A cytokine derived from T cells which stimulates T cell proliferation and NK cell activation.	interleucina-15	interleucina 15
interleukin-18 (IL-18)	A cytokine derived mainly from activated macrophages that shares biological activities with IL-12 in driving the development of TH1 cells by inducing interferon- γ . <i>Syn.</i> : IFN- γ -inducing factor.	interleucina-18	interleucina 18
internal image	An epitope on an anti-idiotypic antibody which binds in a way that structurally and functionally mimics the antigen.	imagem interna	imagen interna
intron	A segment of DNA that separates exons and that does not contain expressed genes (non-coding segment). Introns are transcribed into RNA with the exons but are not translated into proteins.	intron	intrón
invariant chain	A polypeptide which binds MHC class II molecules in the endoplasmic reticulum, directs them to the late endosomal compartment and prevents premature association with self peptides.	cadeia invariável	cadena invariable
ion exchange chromatography	A method for separating molecules based on differences between the overall charges of the proteins. It is usually used for protein purification but may be used for purification of oligonucleotides, peptides, or other charged molecules. The protein of interest must have a charge opposite that of the functional group attached to the resin (stationary phase) in order to bind. Then elution is achieved by increasing the ionic strength to break up the ionic interaction, or by changing the pH of the protein.	cromatografia de troca iônica	cromatografía de intercambio iónico
Ir gene	<i>See</i> immune response gene.	gene Ir	gen Ir



ISCOMS	<i>Acron. for immunostimulatory complexes. They are immunostimulatory complexes of antigen held within a lipid bilayer matrix that acts as an adjuvant; designed to allow antigen to enter cells and be presented on class I MHC.</i>	iscoms	ISCOMS <i>Se mantiene generalmente la sigla en inglés, aunque se aconseja explicar su significado la primera vez que aparece.</i>
isoelectric focusing	A protein identification technique; proteins migrate in an electric field under a pH gradient to the pH at which their net charge is zero (their isoelectric point).	focalização isoelétrica	isoelectroenfoque
isogenic	Genetically identical.	isogênico	isogénico
isograft	A tissue transplanted between two genetically identical individuals.	isoenxerto	isoinjerto
isotype	Any of the subclasses of immunoglobulins defined by the chemical and antigenic characteristics of their constant regions.	isótipo	isotipo
isotype switching	<i>See class switch.</i>	troca de isótopos	cambio de isotipo
ITAM	<i>Acron. for immunoreceptor tyrosine-based activation motif.</i>	ITAM <i>Sigla de motivo de ativação tirosínica de receptores imunológicos. Geralmente é mantido como ITAM, mas convém colocar o significado na primeira vez que o termo aparecer no texto.</i>	ITAM <i>Sigla de estructura tirosínica activadora de los inmunorreceptores. Se mantiene generalmente la sigla en inglés, aunque se aconseja explicar su significado la primera vez que aparece.</i>
ITIM	<i>Acron. for immunoreceptor tyrosine-based inhibition motif.</i>	ITIM <i>Sigla de motivo de inibição tirosínica de receptores imunológicos. Geralmente é mantido como ITIM, mas convém colocar o significado na primeira vez que o termo aparecer no texto.</i>	ITIM <i>Sigla de estructura tirosínica inhibidora de los inmunorreceptores. Se mantiene generalmente la sigla en inglés, aunque se aconseja explicar su significado la primera vez que aparece.</i>
J chain (<i>same as joining chain</i>)	A small glycopeptide that joins two monomers in the polymeric immunoglobulins IgM and IgA.	cadeia J	cadena J (cadena de unión)
J exon (<i>also named joining (J) gene segments</i>)	A gene segment codifying the immunoglobulin and T-cell receptor gene loci and, upon gene rearrangement, encode part of the third hypervariable region of the antigen receptors.	exon J	exón J (segmentos génicos de unión)

K cell (killer cell)	A killer lymphocyte with Fc receptors which allow it to bind to and kill antibody-coated target cells. It mediates ADCC (antibody-dependent cell-cytotoxicity).	célula K (célula assassina)	linfocito K (citolítico)
kappa chain (κ chain)	In the context of immunoglobulins, one of the two forms of immunoglobulin light chains.	cadeia kappa	cadena kappa (cadena)
kinins	A family of peptides released during inflammatory reactions; they increase vascular permeability (are vasodilators) and contract smooth muscle; they derive from injured or inflamed tissue.	cininas	cininas
kiss of death	The contact between cytotoxic T lymphocytes or natural killer cells and their target (infected) cells by direct contact leading to the lysis of the latter. It is due to secretion of specialized granules containing potent cytotoxic molecules.	beijo da morte	beso de la muerte
knock-out animals	Animals in which one particular gene has been inactivated; used to study gene function by looking at the effects of its absence.	animais nocauteados; animais com genes desativados	animales con genes desactivados
Kupffer cells	Macrophages lining the sinusoids of the liver. They remove debris and dying cells from the blood, but are not known to elicit immune responses.	células de Kupffer	células de Kupffer
L chain	<i>Abbrev. for light chain.</i>	cadeia L <i>Abreviação para cadeia leve.</i>	cadena L <i>Denominación abreviada de la cadena ligera.</i>
L selectin	It is an adhesion molecule essential for lymphocyte homing. It is expressed on lymphocytes and its counter-receptor is expressed on high endothelial venules.	selectina L	selectina L
lactoferrin	An iron-containing molecule that has antimicrobial action by binding iron needed for microbial growth.	lactoferrina	lactoferrina
LAD-1	<i>Acron. for leukocyte-adhesion deficiency 1.</i>	LAD-1 <i>Sigla de deficiência de adesão leucocitária 1. Geralmente é mantida como LAD-1, mas é aconselhável colocar o significado na primeira vez que o termo aparecer no texto.</i>	LAD-1 <i>Sigla de deficiencia de adhesión del leucocito 1. Se mantiene generalmente la sigla en inglés, aunque se aconseja explicar su significado la primera vez que aparece.</i>

LAD-2	<i>Acron. for</i> leukocyte-adhesion deficiency 1.	LAD-2 <i>Sigla de</i> deficiência de adesão leucocitária 1. <i>Geralmente é mantida como LAD-2, mas é aconselhável colocar o significado na primeira vez que o termo aparecer no texto.</i>	LAD-2 <i>Sigla de</i> deficiencia de adhesión del leucocito 1. <i>Se mantiene generalmente la sigla en inglés, aunque se aconseja explicar su significado la primera vez que aparece.</i>
lambda chain (<i>or</i> λ chain)	In the context of immunoglobulins, one of the two forms of immunoglobulin light chains.	cadeia lambda <i>ou</i> cadeia λ	cadena lambda <i>o</i> cadena λ
Langerhans cells	Dendritic cells found in the skin, able to act as effective antigen presenting cells.	células de Langerhans	células de Langerhans
lectins	Proteins, usually of plant origin, that can bind specifically to carbohydrates. Many lectins are mitogenic (i.e., can induce lymphocytes to divide), such as Con A and PHA.	lectinas	lectinas
leukocyte-adhesion deficiency 1 (LAD-1)	An immune deficiency in which the adhesion molecule β2-integrin is not expressed.	deficiência de adesão leucocitária 1 (LAD-1)	deficiencia de adhesión del leucocito 1 (LAD-1)
leukocyte-adhesion deficiency 2 (LAD-2)	An immune deficiency in which fucosyl sugars (ligands to selectins) are not produced.	deficiência de adesão leucocitária 2 (LAD-2)	deficiencia de adhesión del leucocito 2 (LAD-2)
leukocyte functional antigens (LFA)	Cell adhesion molecules initially defined with monoclonal antibodies. LFA-1 is a β2-integrin, particularly important in T-cell adhesion to endothelial cells and antigen-presenting cells. LFA-2 and LFA-3 are members of the immunoglobulin superfamily; LFA-3 is now called CD58.	antígenos associados à função de leucócitos	antígenos funcionales del leucocito
leukotrienes	Vasoactive metabolites of arachidonic acid produced by the action of lipoxygenase, which promote inflammatory processes (e.g. chemotaxis, increased vascular permeability) and are produced by a variety of cell types including mast cells, basophils and macrophages.	leucotrienos	leucotrienos
LFA-1, LFA-2 <i>and</i> LFA-3 (<i>see</i> leukocyte functional antigens)	<i>Abbrev. for</i> leukocyte functional antigens 1, 2, and 3.	LFA-1, LFA-2 <i>e</i> LFA-3 <i>Siglas para</i> antígenos associados à função de leucócitos. <i>Geralmente são mantidos como LFA-1, LFA-2 e LFA-3, respectivamente, mas é aconselhável colocar o significado na primeira vez que o termo aparecer no texto.</i>	LFA-1, LFA-2 <i>y</i> LFA-3 <i>Siglas de</i> antígenos funcionales del leucocito. <i>Se mantiene generalmente la sigla en inglés, aunque se aconseja explicar su significado la primera vez que aparece.</i>

ligand	A generic term for the molecules that bind specifically to a receptor.	ligante	ligando
light chain (L chain)	The smaller of the two types of chains that comprise a normal immunoglobulin or antibody molecule. Light chains occur in two forms: kappa (κ) and lambda (λ).	cadeia leve	cadena ligera (cadena L)
linkage disequilibrium	A situation where a pair of alleles are found in a population at an unexpectedly greater frequency when compared with the frequency of the individual genes.	desequilíbrio de ligação	desequilibrio del ligamiento genético
lipopolysaccharide (LPS)	Endotoxin derived from the cell wall of Gram negative bacteria which presents inflammatory and mitogenic actions.	lipopolissacáride (LPS)	lipopolisacárido (LPS)
local immunity	Immunity limited to a given organ or site, such as respiratory or GI tracts.	imunidade local	inmunidad local
low-zone tolerance	Tolerance induced by low doses antigen injection.	tolerância de dose baixa	tolerancia por dosis bajas
lymph	The extracellular fluid that accumulates in tissues and is carried by the lymphatic vessels back through the lymphatic system to the thoracic duct and into the blood.	linfa	linfa
lymph nodes	Secondary lymphoid organs, in which mature B and T lymphocytes respond to free antigen, or antigen associated with APC, brought in via lymphatic vessels.	linfonodos <i>ou</i> nódulos linfáticos	ganglios linfáticos
lymphadenopathy	Enlarged lymph nodes.	linfadenopatia	linfadenopatía
lymphatic system	System of vessels through which lymph travels, and which includes organized structures—lymph nodes—at the intersection of vessels. Three major functions: to concentrate antigen from all parts of the body into a few lymphoid organs; to circulate lymphocytes through lymphoid organs so that antigen can interact with rare antigen-specific cells; and to carry products of the immune response (antibody and effector cells) to the bloodstream and tissues.	sistema linfático	sistema linfático
lymphoblast	A young lymphocyte under proliferation or differentiation that has enlarged and increased its rate of RNA and protein synthesis.	linfoblasto	linfoblasto
lymphocyte repertoire	The total number of antigenic specificities of lymphocytes.	repertório de linfócitos	repertorio de linfocitos

lymphocytes	Small mononuclear cells with a round nucleus containing densely packed chromatin and a thin rim of cytoplasm. They bear variable cell-surface receptors for antigens and they are responsible for specificity, diversity, memory, and self-non-self discrimination. There are two main classes of lymphocytes: B lymphocytes (B cells) and T lymphocytes (T cells), which mediate humoral and cell-mediated immunity, respectively.	linfócitos	linfocitos
lymphoid follicles	Lymphoid aggregates made up of dendritic cells and B lymphocytes. The primary lymphoid follicle contains resting B cells. When an activated B cell enters in the primary lymphoid follicle, a germinal center is formed and the follicle is called secondary lymphoid follicle.	folículos linfóides	folículos linfáticos
lymphoid organs	Organized tissues characterized by very large numbers of lymphocytes interacting with a non lymphoid stroma. The central or primary lymphoid organs, where lymphocytes are generated, are thymus and bone marrow. The main peripheral or secondary lymphoid organs, in which adaptive immune responses are initiated, are lymph nodes, spleen, and mucosal-associated lymphoid tissues such as tonsils and Peyer's patches.	orgãos linfóides	órganos linfáticos
lymphokine-activated killer cells (LAK)	Killer and natural killer cells activated <i>in vitro</i> by exposure to cytokines such as IL-2.	linfócitos citolíticos ativados por linfocinas <i>Quase sempre designadas simplesmente células LAK. Convém colocar o significado na primeira vez que o termo aparecer no texto.</i>	linfocitos citolíticos activados por linfocinas (LAK) <i>Se mantiene generalmente la sigla en inglés, aunque se aconseja explicar su significado la primera vez que aparece.</i>
lymphokines	Soluble substances secreted by lymphocytes, which have a variety of effects on lymphocytes and other cell types.	linfocinas	linfocinas
lymphoma	Tumor of lymphocytes that grow in lymphoid and other tissues but do not enters in the blood in large numbers. There are various types of lymphomas, which represent the transformation of various developmental stages of B or T lymphocytes.	linfoma	linfoma
lymphotoxin	<i>Synonym for TNF-α.</i> A cytotoxic cytokine secreted by inflammatory CD4 T lymphocytes.	linfotoxina	linfotoxina

lysosomes	Cytoplasmic organelles found within phagocytic cells that contain hydrolytic enzymes involved in the digestion of phagocytosed material.	lisossomas	lisosomas
lysozyme	An enzyme present in tears, saliva, and neutrophils. It digests mucopeptides in the cell wall of Gram positive bacteria.	lisozima	lisozima

Nota

^a Singer LM, Igea JM. Glossário trilingüe (EN-PT-ES) de termos, abreviações e acrônimos usados com frequência em Imunologia. 1ª parte. Panace@ 2005; 6 (20): 93-121. <<http://tremedica.org/panacea.html>>

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