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PREPARATION OF NEW RGD MIMETICS "READY-FOR-CLICK"

ABSTRACT

The present invention relates to the development of new RGD or OGP10-14 nonpeptide mimetic materials capable to attach to the surface of biomaterials by a single "click" chemical operation.

The peptidomimetics bound in this way are stable and do not suffer degradation reactions under physiological conditions.

These nonpeptide mimetics are particularly useful for medical devices, including endosseous implants, or tissue engineering scaffold or cell culture matrix, suitable for the replacement or regeneration of human and animal organs.

This invention was developed by researchers from the University of the Basque Country (UPV), TECNALIA and Biomedical Research Networking Centre in Bioengineering, Biomaterials and Nanomedicine (CIBER-BBN).

DESCRIPTION

RGD and OGP are natural short peptides occurring in the extra cellular matrix (ECM) or in serum and they are useful to enhance the adhesion, viability and proliferation of osteoblast cells. However, none of these RGD or OGP10-14 nonpeptide mimetics are amenable to embodiments capable to give further "click" attachment to the surface of biomaterials.

The present invention relates to the development of new nonpeptide mimetics of RGD (Arg-Gly-Asp) and/or, OGP10-14 (Tyr-Gly-Phe-Gly-Gly), osteogenic compounds, containing a central 1,4,5-trisubstituted 1,2,3-triazole core and a reactive appendage appropriate to form covalent "click" bonds on the surface of materials functionalized with reactive groups including: azide, terminal alkyne, cyclooctalkyne, thiol, maleimide or thiolacid groups and to a process for the preparation of RGD and OGP10-14 mimetics containing a 1,4,5-trisubstituted 1,2,3-triazole core.

The different aspects of the present invention are:

A new 1,4,5-trisubstituted 1,2,3-triazole mimetic of RGD and/or OGP10-14.

The process for preparing the non peptide mimetic compounds.

A new material with the surface chemically modified with RGD and/or OGP10-14 mimetics.

A medical device, made from the material described above.

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APPLICATIONS

In vitro Tissue Engineering
Diagnosis technologies
Preparation of endosseous implants
Medical devices
Cell culture matrices

DEVELOPMENT STATUS

Developed

IP STATUS

European Patent granted

AVAILABLE FOR

- Exclusive license agreement
- Non-exclusive license agreement
- Further research or development

INDUSTRIAL PROPERTY

European Patent **EP2749298B1**, validated in France, Germany, Italy, Spain and UK

International Patent Application **PCT/ES2013/070927**, filed on December 26, 2013

National Phases in USA, Canada, China, and Korea

INNOVATIVE ASPECTS AND ADVANTAGES

The new nonpeptide mimetics of RGD or OGP10-14 allow to conduct in a single chemical operation the "click" bonding on the surface of a material.

The peptidomimetics bound in this way are stable and do not suffer degradation reactions under physiological conditions.

Preparation of new implants and medical devices with improved osteogenic properties.

See patent **EP12382534.1** (Modified PAEK polymer: preparation and uses) as complement of this one.

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