

NON-VIRAL NANO-PLATFORMS AS THERAPEUTIC VACCINES AGAINST HIV

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The goal to obtain an AIDS vaccine remains elusive. However, evidence of protection against AIDS viruses in animal models, together scientific advances in understanding disease pathogenic, provide a strong rationale to continue the pursuit of an effective AIDS vaccine to stop the global epidemic.

The *CIBER-BBN*, makes up of research groups on different areas, is an ideal platform to address this problem. Several *CIBER-BBN* groups involved in the chemistry of biological significant molecules (carbohydrates or peptides), in immunochemistry, in molecular immunology, in microbiology and in pharmaceutical technologies, propose a new project aiming to develop new therapeutic vaccines against the human virus of immunodeficiency (HIV).

The participant groups in this project are:

- Laboratorio de GlicoNanotecnología, (LNB-CICBIO, S. Penadés), CICBiomaGUNE, Donostia-San Sebastián.
- Laboratorio de Microbiología Aplicada (IBB-UAB, A. Villaverde), Instituto de Biotecnología y de Biomedicina, Universidad Autónoma de Barcelona.
- Receptores Moleculares Aplicados (AMRG-IIQAB, P. Marco), Instituto de Investigaciones Químicas y Ambientales de Barcelona.
- Química de Péptidos y Nanopartículas (PCB-UB, A. Albericio), Parc Científic de Barcelona- UB.
- Laboratorio de Inmunobiología Molecular (LIBM-HGUGM, M. A. Muñoz), Hospital Gral. Universitario, Madrid.
- Dendrímeros para Aplicaciones Biomédicas (GDAB-UHA, R. Gómez), Universidad de Alcalá de Henares.
- Sistemas de Liberación de Fármacos y Productos Biotecnológicos (SLFPB-EHU, J. L. Pedraz) Universidad del País Vasco, Vitoria-Gasteiz.

The project aims to develop non-viral nano-platform incorporating carbohydrate involved in HIV infection, immunogenic peptides and adjuvant to create potential therapeutic vaccines with activity against HIV infection. The proposed nano-platforms are multifunctional glyconanoparticles and dendrimers incorporating in a synergetic way the molecules which it is expected to raise an immune response.

The proposal can be placed in the CIBER-Nanomedicine area and specifically in the framework of the objective: *Development of new systems for drug delivery and treatment*. With this proposal, we expect:

- To develop chemistry for bio-functionalization of these nano-platforms.
- To better understand the molecular mechanism of how vaccines work.
- To experimentally validate the nano-platform as immunogens.
- To achieve the clinical validation of the multifunctional nano-platforms

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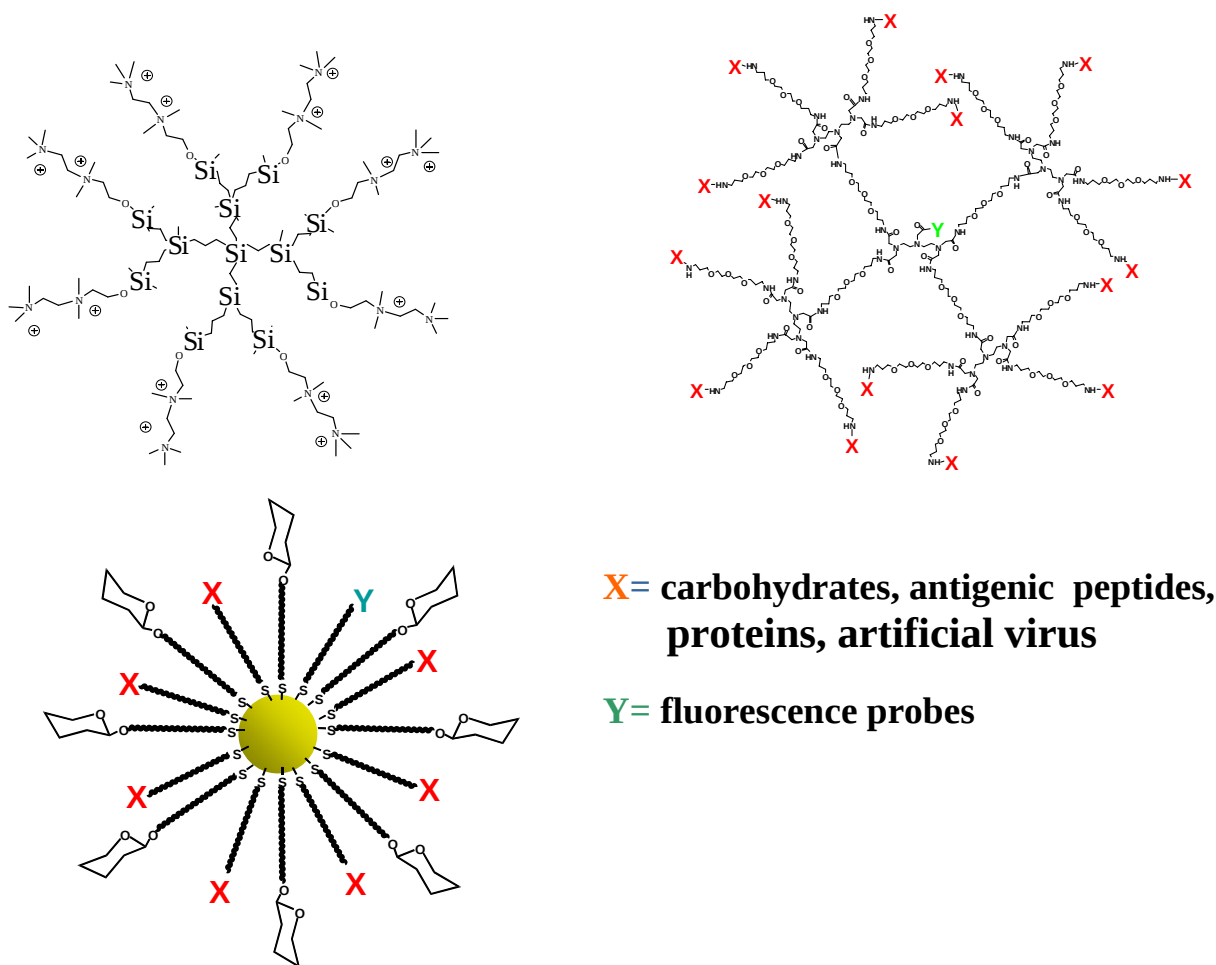


Figure 1: Multifunctional dendrimers and glyconanoparticles as non viral nano-platforms