

## Scaffold Proteins and Therapeutic Nanoconjugates based on Nidogen

Market sector: nanomedicine, biotechnology

Type of opportunity: licensing and/ or co-development

### Scope of the problem

The systemic administration of drugs in form of nanoconjugates benefits from enhanced drug stability when compared to free molecules. Valuable additional properties such as cell targeting might be also merged into a given hybrid composite through the chemical incorporation of functional groups in nanoscale vehicles, taking profit from the high surface/volume ratio of nanomaterials. When administered systemically, the resulting drug loaded conjugates sizing between ~8 and 100 nm escape from renal filtration in absence of aggregation in lung or other highly vascularized organs. This fact, combined with appropriate physicochemical properties of the material might result in extended circulation time and prolonged drug exposure to target organs, thus enhancing the therapeutic impact and benefits for the patient.

As the engineering of protein self-assembling into nanostructured materials is rapidly progressing and the control over the final geometry and physicochemical properties becomes tighter, protein materials are gaining functional and structural versatility as vehicles from chemically coupled drugs. In fact, the attachment of a cytotoxic “payload” to an antibody to form an antibody–drug conjugate (ADC) has been shown to provide a mechanism for selective delivery of the cytotoxic agent to cancer cells via the specific binding of the antibody to cancer selective cell surface molecules.

**Patient need addressed:** Treatment of cancer

### Our innovation:

- Development of new nanostructured protein materials, more specifically therapeutic agent-carrying polypeptides which can be used for therapy
- Polypeptide display library comprising a plurality of polypeptides
- Development of conjugates suitable for selective administration of agents of interest to specific types of cells and tissues
- The agent of interest can be a therapeutic or an imaging agent.
- Method for preparing the conjugate
- Method for preparing a nanoparticle comprising multiple copies of the conjugate

**Competitive advantages:** Specific therapeutic approach which can be targeted to the concrete tumor cells. Reducing the side and off-target effects of the therapeutic agents. Versatile use, application in both therapy and medical imaging.

**Market size/ opportunity:** Global nanomedicine market expected to reach \$261,063 Million by 2023 (Allied Market Research, Nov. 2, 2017).

Global Protein Therapeutics Devices Market is poised to grow at a CAGR of around 8.6% over the next decade to reach approximately \$315.90 billion by 2025 (Protein Therapeutics Market Analysis and Trends - Therapeutic Proteins, Application, Function - Forecast to 2025).

### Intellectual property

European patent application (Priority date: December 26, 2019)

International patent application, PCT (January 11, 2021)