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## Press release

### **Smartox Biotechnology and Sanofi announce a research partnership for the discovery of innovative therapeutic drugs from animal venoms**

**Grenoble (France), February 6th 2014**

Smartox Biotechnology, a start-up company based in France specialized in the study of animal venoms and Sanofi, are pleased to announce a research partnership for the discovery of innovative therapeutic drugs from animal venoms.

#### **Animal venoms as a source of innovative therapeutic compounds**

Snakes, scorpions, spiders and many other animal species are mostly reputed for their dangerousness than for their therapeutic potential. Nevertheless, and contrary to these initial concerns, it was found out that these animal components may well represent a tremendous hope for the medical field. Their venoms represent complex mixtures of small molecules among which peptides are well represented. They have been designed by Nature to block or activate various essential physiological functions in mammals and therefore in humans as well. Indeed, these natural pharmacological tools generally block with high selectivity and efficacy a number of membrane receptors present at the cell surface, including ion channels and G-protein coupled receptors. These receptors and ion channels are all required for the normal functioning of the nervous and immune systems for instance. The deregulation or malfunctioning of these receptors has been observed in many diseases such as cancer, cardiovascular or autoimmune diseases (arthritis, psoriasis ...), pain or diabetes. The ability to modulate the activity of these receptors can often restore the normal functioning of various essential cell types.

Today, more than 40% of marketed drugs act on these membrane receptors, representing an annual turnover of 100 billion euros. Nevertheless, a tremendous number of ion channels and GPCRs are orphan receptors meaning that there are no satisfactory pharmacological tools able to act on them. Finally, for many other cell surface receptors, the existing pharmacological tools are also of low or medium quality. The identification of new drugs acting on these receptors is therefore one of the top priorities of the pharmaceutical industry. Obviously, animal venoms represent important bioactive sources of new molecules that are likely to target these essential pharmacological types of cell receptors.

Venom peptides have already given birth to seven commercial drugs (Byetta, ziconotide, Captopril ...) and several dozen others are in pre-clinical and clinical stage development. This is an outstanding achievement considering that only a few hundreds of venoms have been partially investigated so far. Knowing that there are nearly 170,000 venoms totalizing around 40 million of peptides, this reservoir of natural molecules remains largely under-exploited. There are several reasons that explain this situation: i) venom peptides are technically difficult to analyze because of the small amounts present, ii) venoms are rather complex mixtures, and iii) the complex nature of the venom peptides (disulfide bridges and diversity of folds).

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## Smartox and Sanofi : innovation through research

The contract agreement for a collaborative partnership, signed in December 2013, aims to combine the expertise of Smartox Biotechnology in the study of animal venoms and the expertise of Sanofi for the discovery of new therapeutic molecules. Smartox Biotechnology, through its VenomScreen® division, will implement all of its knowledge to supply Sanofi with venoms ready to use. Sanofi will investigate the therapeutic properties of the venom peptides by performing *in vitro* biological high-throughput screening assays on various cell lines. Molecules of interest, also termed "hits", will then be reinvestigated by Smartox Biotechnology to i) determine their chemical identities and ii) to chemically reproduce these peptides in their synthetic forms. Later on, these leads may be optimized to perform additional investigations. Sanofi will be in charge of all biological experiments and preclinical and clinical developments.

### Quote

Bérourd Remy, CEO of Smartox: "We are extremely glad to collaborate with pharmaceutical companies such as Sanofi to exploit the therapeutic potential of animal venoms. These natural libraries have been largely under-exploited in the past due to technical difficulties. Today, pharmaceutical companies can have access to our VenomScreen® department to access to this fabulous source of potential drugs".

## About Smartox Biotechnology - [www.smartox-biotech.com](http://www.smartox-biotech.com)

Smartox Biotechnology is a French start-up company specialized in the study of animal venoms. Venoms are composed of hundreds of different molecules, which include peptides that are small molecules with exceptional structural and functional properties. These peptides are efficient modulators of the activity of numerous membrane receptors of the cell surface making them particularly interesting for use as drugs or for studying several physiological processes of the human body. VenomScreen®, a division of Smartox Biotechnology, is in charge of studying natural venoms by using the latest technologies in mass spectrometry while SmartFold® division will be in charge of reproducing the most interesting peptides by proprietary processes. Thus, Smartox Biotechnology offers two complementary services to the pharmaceutical industry: from drug discovery based on its collection of venoms, to its chemical synthesis facility at the origin of a wide range of natural molecules dedicated to basic research. In parallel, Smartox Biotechnology conducts its own research programs to provide therapeutic solutions in the field of oncology. Smartox Biotechnology has the support of Floralis (Technology Transfer Office), Grenoble Alpes Incubation, Réseau Entreprendre Isère, Rotary club, BPI France, INSERM and the Joseph Fourier University of Grenoble.

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