

Brussels, 11 September 2007

Details of new influenza research projects announced today

IP/07/1298 announces €27 million of new funding for research projects in the field of influenza. This MEMO outlines the 11 projects pre-selected for funding. Final budget figures (EU contribution) and project details are subject to the final signature of contracts, and so may change. A glossary of terms used in the project descriptions is found at the end of the document.

AsiaFluCap – Health system analysis to support capacity development to respond to pandemic influenza in Asia

Operational planning to implement strategic pandemic influenza plans remains a major challenge. This project will provide a framework to evaluate health system operational capacity and, in 4 settings (Vietnam, Indonesia, Thailand, Taiwan), systematically determine operational capacity gaps in order to support containment and mitigation of pandemic influenza.

- Duration: 3 years
- EU contribution: € 2.6 million
- Coordinator: Dr. Richard Coker, London School of Hygiene and Tropical Medicine, UK, richard.coker@lshtm.ac.uk
- Partners from: United Kingdom, Germany, The Netherlands, Thailand, Indonesia, Taiwan and Vietnam

Fluarray – Development and validation of a microarray based automated diagnostic system for the detection of influenza virus types and subtypes at point-of-care

Early diagnosis is crucial for influenza treatment and control and is also a key component of surveillance activity. This requires the ability to detect and accurately diagnose infection at or close to the source/outbreak with minimum delay. Fluarray will work to convert microarray assays, that have powerful capability to test for a large number of different influenza types, but are laborious, complex and expensive to perform, into a simple, robust, and affordable automated point-of-care system for the diagnosis of influenza. Thus small laboratories, health offices, veterinary clinics and outposts (airports) could be provided with the diagnostic capability of major research institutions and reference centers.

- Duration: 3 years
- EU contribution: € 2.77 million
- Coordinator: Prof. Andrea Crisanti, University of Perugia, IT, crisanti@unipg.it
- Partners from: Italy, United Kingdom and France

FluDrugStrategy – Combatting influenza using a novel drug strategy

The project aims to design, analyse and test in two separate experimental systems a new class of antiviral drug that specifically binds to the influenza A capsid protein. It will combine knowledge-based design and synthesis of compounds with unique image analysis and mathematical algorithm software to find and develop new types of potential antiviral molecules that would be less sensitive to viral mutation or reassortment.

- Duration: 2 years
- EU contribution: € 1.49 million
- Coordinator: Dr. Heather Marshall-Heyman, Vironova AB, Nacka, SE, heather.marshall-heyman@vironova.com
- Partners from: Sweden, Germany, Bulgaria and The Netherlands

FLUINHIBIT – Small Molecule Inhibitors of the Trimeric Influenza Virus Polymerase Complex

In view of the very few efficacious drugs against influenza virus infections and the time it takes to develop a matching vaccine, there is an unmet worldwide need for new anti-influenza drugs. The viral enzyme that replicates the genetic material (RNA polymerase complex) is an attractive target for inhibition of the virus. However, due to the absence of detailed information about its structure and the functions of its subunits, inhibitors of RNA polymerase developed as drug candidates are extremely scarce so far. Based on the recent promising finding of a peptide that – by interfering with the interaction of two enzyme subunit – blocks its activity and viral spread, FLUINHIBIT aims at discovering small molecule inhibitors of this subunit interaction that is crucial for viral replication.

- Duration: 2 years
- EU contribution: € 1.48 million
- Coordinator: Dr. Beatrice Dolores Pilger, Pike Pharma GmbH, Zürich, CH, beatrice.pilger@pharma.ethz.ch
- Partners from: Switzerland, Germany, Lithuania, Austria and Italy

FLUMODCONT – Modelling the spread of pandemic influenza and strategies for its containment and mitigation

Mathematical models to evaluate patterns of spatio-temporal spread of influenza infection, and the effectiveness of various containment strategies need to be significantly improved and elaborated in order to inform EU-wide policy and responses. Building on the results of several previous EU research projects, FLUMODCONT will collect detailed data on population structure, workplace sizes, and population movement, and perform surveys focused on identifying potential “super-spreaders” and on attitudes towards and potential behavioural changes during a pandemic. A suite of mathematical models will be developed, integrated and validated and will serve as tools to evaluate the effectiveness of for example school and workplace closures, travel reductions, quarantine, antiviral prophylaxis and mass or targeted vaccination.

- Duration: 3 years
- EU contribution: € 2.24 million
- Coordinator: Coordinator: Prof. Andrea Pugliese, Università degli Studi di Trento, IT, pugliese@science.unitn.it
- Partners from: Italy, United Kingdom, France, The Netherlands, Finland and Romania

IMECS – Identification of Mechanisms Correlating with Susceptibility for Avian Influenza

The mechanisms of immunity for avian influenza are inherently different from those for human/seasonal influenza. The IMECS project – based on an existing EU network – aims to elucidate these mechanisms and thus to provide an essential prerequisite for development of breakthrough pandemic vaccines. It will determine “correlates of protection” for the clinical screening of vaccine candidates in healthy adults and in different target groups (such as infants and the elderly) and develop a programme for the screening of vaccine candidates *in vitro*.

- Duration: 4 years
- EU contribution: € 2.79 million
- Coordinator: Dr. Claire Boog, Nederlands Vaccin Instituut, Bilthoven, NL, claire.boog@nvi-vaccin.nl
- Partners from: The Netherlands, Finland, Switzerland, Italy and Vietnam

NASPANVAC – Nasal Pandemic Influenza Vaccine

The overall goal of this project is to develop an effective, user-friendly, heat stable and intranasally delivered vaccine to control the highly pathogenic form of avian influenza (H5 and H7 subtypes), which has the potential to cause another global influenza pandemic. A special adjuvant system, using chitosan, will be used to increase the immune response. Intranasal vaccination has a number of potential advantages, such as creating local (mucosal) immunity at the sites of virus entry, avoiding the need for injection and safe disposal of needles, greater public compliance and suitability to rapid mass vaccination programs. In addition this vaccine promises a substantial level of cross-protection against drifted strains of H5 or H7.

- Duration: 3 years
- EU contribution: € 4.06 million
- Coordinator: Dr. Inderjit J. Gill, Archimedes Development Ltd, Nottingham, UK, indergill@archimedespharma.com
- Partners from: United Kingdom, Ireland, France, Norway and Italy

PORTFASTFLU – Portable automated test for fast detection and surveillance of influenza

The objective of PORTFASTFLU is to develop and validate a rapid (less than one hour) test for influenza that will be used as point-of-care test system in developed and developing countries. It will be based on nucleic acid testing, a testing method suitable for both early detection and late surveillance of influenza, and currently routinely used by WHO and OIE virology reference laboratories. Sample preparation, nucleic acid amplification, microarray hybridisation and fluorescent readout will all be integrated into one single portable system, using state-of-the art technologies, such as microfluidics and on-chip sample preparation.

- Duration: 3 years
- EU contribution: € 2.96 million
- Coordinator: Dr. Claude Weisbuch, Genewave S.A.S., Evry, FR, claudeweisbuch@genewave.com
- Partners from: France, Ireland, Belgium, Spain and United Kingdom

RANGER - Rapid, robust & scaleable platform technology for fully automated reference laboratory grade Polymerase Chain Reaction (PCR) based diagnostics regardless of global setting.

RANGER aims to provide an innovative yet pragmatic solution to the immediate need for a rapid, robust, cost-effective and user-friendly point-of-care diagnostic for influenza infection. It will do so with a rapid real-time PCR-based system with the following differentiators: Robust and portable system, raw sample to result automation, parallel processing of multiple samples and different sample types, rapid presentation of a simple negative/positive result, eliminating the need for cold storage chains, high-confidence results with high sensitivity and specificity, and combining the results with surveillance software and with geographical information (GPS).

- Duration: 2 years
- EU contribution: € 2.98 million
- Coordinator: Dr. Andrea Hamilton, Enigma Diagnostics Limited, Salisbury/UK, andrea.hamilton@enigmadiagnostics.com
- Partners from: United Kingdom, Italy, Denmark, The Netherlands and Thailand

RNAFLU – Effect of natural viral RNA sequence variation on influenza virus RNA function

Influenza A virus has an amazing ability to rapidly change its properties. RNAFLU will investigate whether pathogenic properties of the virus (and its ability to adapt to a new host) could be determined by differences in the RNA sequence that do not affect the protein sequence of the virus genome. The exact RNA sequence is of paramount importance since it affects the secondary structure and function and utilisation efficiencies of the viral RNAs in their interaction with proteins. Via mRNA splicing, mRNA stability and translocation, the exact sequence of the influenza virus RNA could therefore affect the replication efficiency of each virus strain. The results of this project could eventually help to understand how the virus can change so quickly into a highly pathogenic form and lay the ground for new diagnostic tools that can quickly identify highly pathogenic strains.

- Duration: 2 years
- EU contribution: € 1.26 million
- Coordinator: Prof. Stefan Schwartz, Uppsala University, SE, stefan.schwartz@imbimuu.se
- Partners from: Sweden, The Netherlands and Spain

TAMIFLU.OR – Organocatalytic approaches towards easily synthesised, economical and high-yielding Tamiflu derivatives¹

Inhibitors of neuraminidase, an essential enzyme for viral replication in influenza viruses, such as oseltamivir phosphate (Tamiflu) or zanamivir (Relenza) are an essential part of the defence against influenza and possibly for the mitigation of a pandemic. Public demand for stockpiles of Tamiflu has increased greatly recently. However, natural sources of the drug are scarce and the known ways to synthesise the drug are complex and expensive. In order to find new drug candidates, cut the cost of the drug and improve its availability and efficiency, new chemical synthesis pathways are necessary. TAMIFLU.OR proposes a new “domino” reaction based on an organocatalytic approach to the synthesis of new Tamiflu derivatives.

- Duration: 3 years
- EU contribution: € 2.3 million
- Coordinator: Prof. Pier Giorgio Cozzi, Università di Bologna, IT, piergiorgio.cozzi@unibo.it
- Partners from: Italy, Slovakia, Germany, Finland and China

Glossary

adjuvant = a substance that is added to a vaccine in order to increase the body's immune response to this vaccine. This will usually allow achieving efficient protection from the disease with a lower amount of vaccine.

correlates of protection = laboratory markers of immune response that correlate with the level of clinical protection (from influenza, subsequent to vaccination or exposure)

in vitro = in the test tube, in cell culture (as opposed to *in vivo* = in live animals or humans)

organocatalysis = the increase in the rate of a chemical reaction caused by an organic (= carbon containing) compound

pathogenesis = the mechanism by which certain factors cause disease

polymerase = a virus protein that is essential for its replication

RNA = ribonucleic acid; the genetic material of influenza viruses

¹ Acronym and title to be changed to avoid conflict with trade name.