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Human brain and graphene projects win funding

By Clive Cookson

Modelling the human brain in a supercomputer and exploiting the “wonder material” graphene will be the two €1bn flagships of European research for the next 10 years, the EU will announce on Monday.

The Human Brain Project is an ambitious plan to “reverse engineer” the brain by simulating its details in silicon. It will be an extension of the current [Blue Brain project](#) led by Henry Markram at Switzerland’s École Polytechnique Fédérale de Lausanne.



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The second project will augment the vast research effort already taking place around the world to harness the amazing properties of graphene – sheets of carbon one atom thick and extending indefinitely in two dimensions.

First isolated at the University of Manchester in 2004, graphene has better electrical and thermal conductivity, mechanical strength and optical purity than any other material. Its applications range from transistors to batteries and solar cells, flexible displays to aircraft wings and tissue engineering.

Each project will receive at least €500m from the European Commission’s Future and Emerging Technologies programme over 10 years, matched by other public and corporate sources.

Although only the ramp-up funding of €54m each for the first two years can be guaranteed under the commission’s current Framework Seven research budget – and the budget of its successor, Horizon

2020, remains uncertain – it seems unlikely the EU will fail to support the high-profile flagships as promised for a whole decade.

Vice-President Neelie Kroes will officially name the two winners in Brussels on Monday morning. They were chosen from a [short-list of six potential flagships](#), on the basis of proposals worked up over the past two years to tackle “grand challenges” in science and technology. Losing projects included developing robots

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as personal companions and applying genomic information to individual patients.

Of the two successful flagships, the Human Brain Project is the more surprising winner – partly because it is closely associated with its leader. Professor Markram is a charismatic neuroscientist whose ambitious supercomputer-based approach is quite controversial among brain researchers. However, the plan for the Human Brain Project promises to spread the work widely around European universities and other research institutions.

The data fed into the brain project's supercomputers will come from systematic analysis of the anatomical, genetic and electrical properties of rat, mouse and human brains. "It will bring together everything we know and everything we can learn about the inner workings of the brain's molecules, cells and circuits, collect the knowledge in massive databases and use it to build biologically detailed simulations of the complete human brain," the project manifesto says.

"The benefits for society will be huge," it promises. These include learning from neuroscience to design better computers and robots – and, by understanding how the brain works, improve the diagnosis and treatment of neurological disease.

The graphene project, co-ordinated by Jari Kinaret at Chalmers University of Technology in Sweden, will distribute its research over a very wide range of participants: 74 universities and companies are listed in its manifesto.

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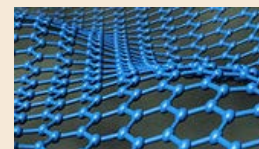
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