

NATURE | BREAKING NEWS

Billion-euro brain simulation and graphene projects win European funds

Efforts to model the whole brain and to push graphene into the marketplace triumph in flagship contest.

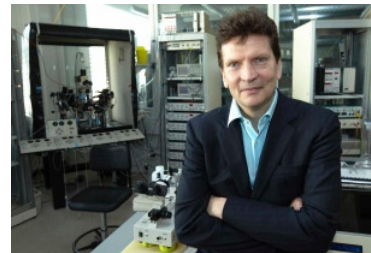
Alison Abbott

23 January 2013

The European Commission has selected the two research proposals it will fund to the tune of half-a-billion euros each after a two-year, high-profile contest.

The Human Brain Project, led by neuroscientist Henry Markram at the Swiss Federal Institute of Technology (EPFL) in Lausanne, plans to simulate everything known about the human brain in a supercomputer — a breathtaking ambition that has been met with some scepticism (See “Brain in a box”).

The other project, called Graphene, is led by theoretical physicist Jari Kinaret at Chalmers University of Technology in Gothenburg, Sweden. It will develop the potential of graphene — an ultrathin, flexible and conducting form of carbon — along with related materials for applications in computing, batteries and sensors.



Henry Markram is co-director of the Human Brain Project, one of two programmes to win €500 million of European funding.

DENIS BALIBOUSE/REUTERS

The projects expect to receive €1 billion over ten years, half to be provided by the European Commission and half by participants. The commission will make its formal announcement on Monday, 28 January.

The Future and Emerging Technologies (FET) Flagship competition was launched in 2009 as a challenge to apply information and communication technologies to social problems. The Human Brain Project claims that it will aid medical advancement in brain disorders. Graphene claims it will lead to development of new materials that will revolutionise diverse industries.

The final winners were selected from a shortlist of six projects as being the most likely to achieve the paradigm-shifting advances they claim. They will now enter the so-called ‘ramp-up’ phase, each receiving €54 million over 30 months. That represents the last cash available from the EU’s expiring 7th Framework Programme of Research.

Subsequent phases will be supported under its successor programme, Horizon 2020, though the structure of that programme is still being negotiated and some observers fear that funds may be scaled back.

Competition winners declined to comment to *Nature* in advance of the official announcement, though news of the selections had already been reported by Spanish and Italian outlets. But scientists in losing projects said that the competition was helpful because of the interdisciplinary contacts they forged. Physicist-turned-sociologist Dirk Helbing, of the Swiss Federal Institute of Technology (ETHZ) in Zurich, is still upbeat about the candidate project he helped to lead: FuturICT, which proposed planetary-scale modelling of human activities and their impact on the environment. “We created a whole new science for the twenty-first century and we are planning to live on,” he says.

Nature doi:10.1038/nature.2013.12291

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2013-01-24 12:13 PM

Dario Ringach said: "... plans to simulate everything known about the human brain in a supercomputer..." Really?! Here you go:

```
#include <brain.h>
```

```
int main(){
return(0);
}
```

2013-01-24 01:24 AM

Anna Carbone said: There are little doubts that all these projects are very likely to achieve the paradigm-shifting advances they claim or even "create a whole new science for the twenty-first century", to use the words of Dirk Helbing.

However, the mindful reader will easily note that the true, and only finalist of the competition is the FET Flagship initiative itself.

In the same way that the main character of the play "The Cherry Orchard" by Chekhov, is not Varya and neither Dunyasha nor Trofimov nor Lopakhin, but the Orchard itself; the place that makes all the actions happen.

No other EU competition has been able to generate such a level of scientific excellence, open competition and impact worldwide as the Flagship initiative.

Having the FET Flagship Programme as a well-established funding instrument would be of great help to create the ultimate and most urgent paradigm shift: To generate ultimate excellence and innovation in the European Research Area.

The true challenge is now on the European Commission rather than on the Graphene, Human Brain or FuturICT communities.

To quote Wolfgang Boch, who coordinates the FET Flagship initiative in Brussels, in the comment appearing in Science on January 4, 2013: "The Flagships weren't created to launch two projects, but to see whether this is a feasible funding model".

Would the EC transform this 'experiment' in a continuous funding mechanism able to catalyse scientific excellence in Europe and beyond ?

Anna Carbone

Politecnico di Torino

2013-01-24 11:58 AM

Terence hale said: Hi,

The Human Brain Project. McCulloch-Pittig around I hope the resulting computer can translate good but this may be just a waste of money without the advancements of quantum computing which is needed for the neurological parallel processing.

2013-01-27 01:06 AM

Barbara Wright said: 'As a computational neuroscientist, I do exactly the same kind of modeling as Blue Brain and a single cortical column is nowhere near to the whole brain. The Organization for Computational Neurosciences just had their annual meeting this past summer and many attendees felt that he was misleading the public with the '10 yrs' comment. Cortex is sexy as it contains the primary sensory and motor centers of the brain but you can't ignore the cerebellum (motor, timing, coordination), brain stem, hippocampus (memory, learning), and the entire limbic system (emotions, arousal), among others. Those areas are certainly involved in a "thinking, remembering, decision-making, biologically accurate brain." Don't forget the HUGE community of experimentalists & modelers that are working on imaging, biochemistry, biophysics of membranes and ion channels, transgenic animal models of disease, etc. There is too much we don't know that would need to be incorporated to even think of looking for consciousness'

2 'He claims to build the model from the ground up, biological first principles if you will, yet ignores a lot of what we know to be going on and ignores that we're missing data he needs for the model. Markram does say with certainty how far away he thinks he is from his goal without laying out a truly objective evaluation of why and how. Whether neurons are scalable is still a huge matter of debate in the modelling world and the lay audience doesn't necessarily know what constitutes a physical brain, much less what leads to consciousness. I don't presume to know what makes a good theory of consciousness but just wanted to point out what his model does NOT consider and leave it to others to decide how that affects the conclusions that come out of the model. I mostly object to his attitude, which alienates his colleagues and has already significantly undermined his scientific support. Oversimplifying the project in this talk might help get funding but it doesn't help the science.'

2013-01-28 09:06 AM

mehmet umut caglar said: it seems there is a mistake in the news, because in the official announcement the lady says "one billion euros each" about the grants.

<http://ec.europa.eu/avservices/player/streaming.cfm?type=ebsvod&sid=221251>

at 2:20

2013-01-28 12:01 PM

Ananyo Bhattacharya said: Mehmet – the projects are expected to cost a billion each but the EU is stumping up half the amount. the rest will be provided by project participants.

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