

# Gamers use PS3s to do biomedical research

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It's kind of like SETI@home, but with PS3s instead of PCs and molecules instead of aliens. In the latest volunteer scientist program, called PS3GRID, anyone who owns a Sony PlayStation3 can donate their system's downtime to compute enzymatic reactions and ion conductivity to help an international team of biomedical researchers.

PS3GRID is coordinated by researchers at the Research Unit on Biomedical Informatics (GRIB) at the Instituto Municipal de Investigación Médica and the Universidad Pompeu Fabra in Barcelona, Spain. The distributed infrastructure enables any PS3 to do computations on atomic and molecular simulations

The researchers, headed by GRIB scientist Gianni De Fabritiis, chose the PS3 because it is the first consumer device to contain the IBM Cell processor. "The Cell," which is more than an order of magnitude faster than standard Intel or AMD processors, optimizes the types of

computation commonly used in graphics applications. In addition, the Cell offers an inexpensive and powerful method to perform highly detailed molecular dynamics simulations of biomedical systems. Using the Cell, a PS3 has the computational power equivalent to about 20 PCs.

To date, 130 PS3s are hooked up to PS3GRID. Essentially, each PS3 helps to model a very large molecular system at the atomic level over a longer period of time than could be achieved with the researchers' own systems. One step of a molecular dynamics simulation usually takes about 1 femtosecond ( $10^{-15}$  seconds). Due to large computational costs, simulations of evolving systems are usually limited to a few nanoseconds ( $10^{-9}$  seconds). However, biological processes commonly occur over timescales of micro- ( $10^{-6}$  seconds) or milliseconds ( $10^{-3}$  seconds).

With the computational power of enough PS3s, simulations might be carried out for longer periods, enabling molecular dynamics simulations to give broader insight into a variety of biomedical applications.

"Given that there are currently 3 million PS3s in the world, the combined computational force of all the PS3s reaches that of a powerful supercomputer," said De Fabritiis.

PS3 owners can join the collaboration online at <http://www.ps3grid.net/>. At the site, users download the 512-MB program to a pen drive, and then insert the pen drive into the USB port on a PS3. After installing the program with a click, the program starts automatically. An Ethernet (cable) connection is also required to connect to the Internet. To return to game mode, the PS3 is simply restarted.

More advanced users also have the option to install Linux on their PS3s. With Linux the PS3 can double as a normal computer for browsing the net, writing documents and running BOINC.

More information is available at <http://www.ps3grid.net/>.

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