

## The Homology Modeling Service GPCRM for Construction of GPCR Models

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GPCRs belong to a super family of cell surface signaling proteins, which are embedded in the membrane. About 800 of them is present in the human genome comprising of about 4% of the human genes. Currently, there are over 200 structures of GPCRs in Protein Data Bank (PDB). GPCRs are sensitive to variety of signals: photons, odorants, nucleotides, lipids, peptides and even small proteins. It is estimated that 30%-50% of modern drugs act by binding to GPCRs. GPCRs play a pivotal role in many physiological processes and in multiple diseases including cardiovascular and mental disorders, cancer and viral infections. Therefore, there is a need for new, high quality models of GPCRs. The updated homology modeling service GPCRM (<http://gpcrm.biomodellab.eu/>) meets those expectations by greatly reduced time of execution of submissions (from days to hours/minutes) with nearly the same average quality of obtained models. GPCRM is continually upgraded in semi-automatic way and the number of template structures increased from 20 in 2013 to over 90. Additionally, due to three different scoring functions (Rosetta, Rosetta-MP, BCL::Score) it is possible to select accurate models for the required purposes: the structure of the binding site, the transmembrane domain or the overall shape of the receptor.