Life Sciences depend heavily on the use of HPC for both data mining and data integration as well as for the simulation of biological systems.
HPC
technologies are essential for research areas such genome analysis, expression profiling,
-omics
analysis and biological simulations, whereby a vast amount of experimental data needs to be analyzed and synthesized into reasonable hypothesis. Thus
HPC
would greatly facilitate the various applications described in this project, enabling the respective research teams to study questions that have thus far been intractable due to their high computational complexity. The use of
HPC
in the Life Sciences applications with help further our understanding of basic problems in the fields of DNA sequence analysis, comparative
genomics
, and brain modeling among others and can be of great importance for the health sector.

The Life Sciences VRC supports 7 applications with main developers in 5 SEE countries (Greece, Hungary, Montenegro, Armenia, Georgia) working in the areas of computational biology, computational biophysics, DNA sequence analysis and computational
genomics
. The various projects involve collaborations with numerous scientists both in Europe and the U.S. and will foster the development of new collaborations among the participant SEE countries.

- **CMSLTM -** Computational Models of Short and Long Term Memory
  George Kastellakis, IMBB-FORTH, Greece production

- **DeepAligner -** Deep sequencing for short fragment alignment
  Windisch Gergely, Márton Judit,Obuda University (OU), John von Neumann Faculty of Informatics, Biotech Group, Hungary

- **DiseaseGene - ** In-silico Disease Gene Mapper
  Windisch Gergely, MártonJudit, Obuda University (OU), John von Neumann Faculty of Informatics, Biotech Group, Hungary

- **DNAMA -** DNA Multicore Analysis

School of Computer & Communication Sciences, Laboratory for Computational Biology and Bioinformatics, RAxML software, Montenegro

- **MDSCS -** Molecular Dynamics Study of Complex systems
  Dr. Armen Poghosyan, Dr. Hrachya Astsatryan, National Academy of Sciences of the Republic of Armenia

- **miRs -** Searching for novel miRNA genes and their targets
  Anastasis Oulas, IMBB/FORTH, Greece

- **MSBP -** Modeling of some biochemical processes with the purpose of realization of their thin and purposeful synthesis
  Jumber Kereselidze, Tbilisi State University Department of Natural Science, Georgia