# The 158<sup>th</sup> iCeMS SEMINAR

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## Chemotaxome – A new member with complex biological entities in systems biology

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#### Venue: 2nd Floor Seminar Room (#A207) iCeMS Main Building (#70), Kyoto University

Chemotaxis is one of the most significant cellular responses in functional cell biology. Integrated cellular, biomaterial and functional complexity of the response system (cell adhesion – chemotaxis – phagocytosis) justify the description of the 'Chemotaxome' as a new member of 'Omes', where classification is supported at different levels of systems biology.

In this presentation, the 'Chemotaxome' and its organization, will be discussed with respect to the most significant levels of the chemotaxome network:

- (i) migration is a general property of prokaryotic (bacteria) and eukaryotic cells (i.e. ciliates, amoebas, sperm, WBCs etc.) though it is uniquely defined for different taxa (Taxonome);
- (ii) chemotaxis/chemokinesis represents a characteristic type of cell biological responses and covers a wide scale of responses in healthy tissues/individuals (i.e. fertilization, differentiation of tissues, angiogenesis) as well as in pathological cases (Functiome);
- (iii) dedicated groups of signalling molecules (i.e. chemokines, formyl peptides as well as non-professional chemoattractants) are required for chemotaxis, while chemotaxis receptors (i.e. FPR, CCR, CXCR) and their intracellular signalling pathways have unique sensitivity towards to the triggering chemoattractant (Ligandome, Regulome, Interactome, Proteome-Glycome-Lipidome).

The genetic determination of these three interacting components mentioned above are coded in the DNA of the cell (e.g. IL-8 - 4q13-q21) (Genome); while complex relations of molecular genetic backgrounds and phylogenetic approaches (i.e. amino acids of prebiotic soup; chemotactic selection) belong to the molecular aspects of evolution (Phylogenome).







