Chapter 1

General Introduction

Signal transduction systems

Major evolutionary transitions

- High diversity of life on earth

- Events of major evolutionary transitions have helped to shape the direction of evolution and consequently brought to the current biodiversity on earth

- One primary example is the passage from prokaryote to eukaryote

- One major example within eukaryotes is the passage from unicellular organisms to multicellular organisms

- This has occurred in several independent occasions throughout eukaryotic history leading to very divers sets of multicellular organisms (e.g. plants, fungi and animals)

- Within animals the current hypotheses about origin of multicellularity are ...

- Current hypotheses that brought to the origin of animals through multicellularity

- Major implications/consequences of multicellularity:

1-the ability to interact with the environment as a whole organism rather than as a single cell

2-subspecialisation of different cells for different tasks

3- need for cells to communicate and coordinate amongst each other

Expansion of signal transduction systems in animals

More details of point 3 above.

- while signal transduction occurs also in unicellular eukaryotes (check) in animals it becomes even more essential

Introduction about vision

Introduction about chemokine signalling

References

Bich L, Pradeu T, Moreau J-F. 2019. Understanding Multicellularity: The Functional Organization of the Intercellular Space. *Frontiers in Physiology* [Internet] 10. Available from: https://www.frontiersin.org/articles/10.3389/fphys.2019.01170

Brunet T, King N. 2017. The Origin of Animal Multicellularity and Cell Differentiation. *Developmental Cell* 43:124–140.

Buss LW. 1987. The Evolution of Individuality. Princeton University Press Available from: https://www.jstor.org/stable/j.ctt7zvwtj

Ruiz-Trillo I, Nedelcu AM. 2015. Evolutionary Transitions to Multicellular Life: Principles and Mechanisms edited by Iñaki Ruiz-Trillo and Aurora M. Nedelcu. *Advances in Marine Genomics 2. Springer* 91:370–371.

Smith T late PJM, Szathmary E, Smith T late PJM, Szathmary E. 1997. The Major Transitions in Evolution. Oxford, New York: Oxford University Press