BABS2264

Lecture 2

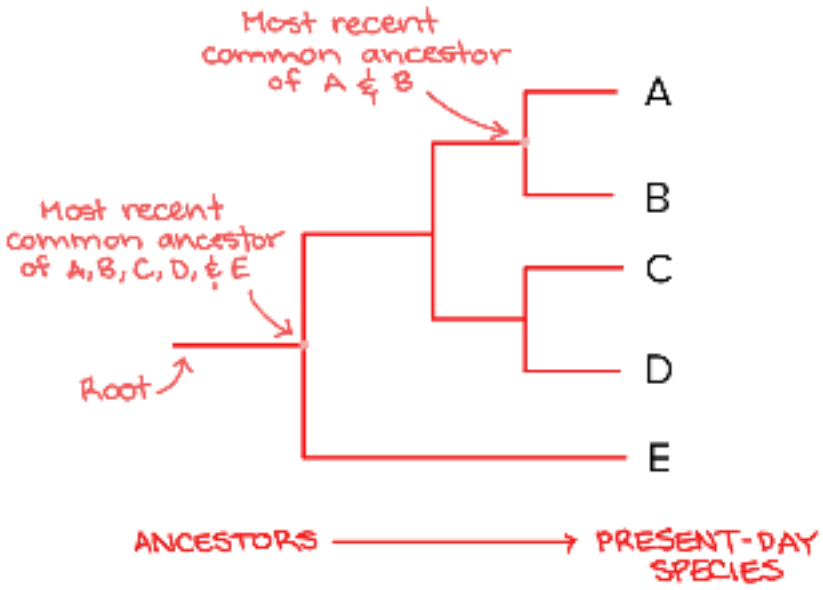
Model Organisms

17 September 2019 / 17:00 / Paul Waters & Bill Ballard

NOTES

Phylogenetic Relationships

- Trees



  - Come in different shapes and directions
  - E.g. E species is equally related to A, B, C and D
- Model Organism
  - Specific species or Organism
  - Extensively studied
  - Used to advance our understanding
    - Cellular function
    - Development
    - Disease
  - Ability to apply knowledge to other organisms

- Current Models:
  - Drosophila (Insect)
  - Mice (Mammalian)
  - Zebrafish (Fish)
  - Yeast (Funghi)
  - E.coli (Bacteria)
  - C.elegans (Worm)
  - Arabidopsis (Plant)
  - Many Other … (Considered non-traditional models)

Mice

- Why Mouse?
  - Historical Reasons
    - Now used almost universally
    - Excellent Genomic Resources
    - Well Established tools (Gene Removal)
  - Mammal (~closely related to humans)
  - Easy to breed and keep
  - Most people don’t care too much about mice…
  - In the course, the purpose is using X inactivation as a model for epigenetics (regulating a gene)
- Limitations of Mouse Models
  - A mammal but not human,
    - Therefore some diseases that we have cannot be fully modelled in mice, or develop differently
    - Treatments that work in might not work in humans
  - Its genome is very rearranged, which is uncommon between mammalian species
- To choose a model it is necessary to understand the question that is being asked
  - You need a deep understanding of both your question and your model
  - E.g. Mice are a good model for X inactivation as they are mammals, undergo methylation, and have an X chromosome.

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Lecture 23

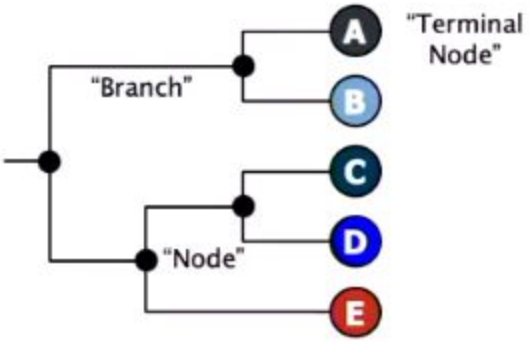
Evolution of Genes and Traits 3

11 November 2019 / 14:00 / Richard Edwards

NOTES

Molecular Phylogenetics

- Classical phylogenetics: Establish relationships between organisms
    - Taxonomy
- Molecular phylogenetics is establishing relationships between genes
    - Orthology
- Placing evolution (and conservation) in context



Topology

- At the terminal node, its a gene or protein sequence
- Longer branches still have the same topology

Branch Lengths