Vertebrates

1. Organizing chordates, By Jordi Garcia-Fernandez
Understanding how the chordate body plan originated and evolved is still controversial. Page 619

However, whether the vertebrate organizer was primitively present in early chordates or was acquired at the origin of vertebrates was unclear and a subject of **debate**. Page 619

2. Vertebrate neural crest, By Gerhard Schlosser
However, two conflicting models have been put forward to explain how contiguous domains of neural crest and panplacodal primordium are established at the neural plate border and these different models suggest a common or independent evolutionary origin of neural crest and placodes, respectively. Page 660

At present, we do not have sufficient evidence either from developmental studies in vertebrates or from comparative and paleontological studies to conclusively decide between these two scenarios. Page 661

3. The odontode explosion, By Gareth J. Fraser
How and when tooth-like units (odontodes) originated during vertebrate evolution continues to cause a stir among palaeontologists and evolutionary developmental biologists. Page 808

Two main theories polarise the field: the traditional view, that skin denticle competent ectodermal-epithelium folded and integrated into the mouth to provide the inductive capacity for teeth – the 'outside-in theory' – is contested by the 'inside-out theory' that teeth, born from endoderm, originated in the posterior pharynx of jawless vertebrates with dental potential co-opted anteriorly to oral jaws during gnathostome evolution. Page 809

Debate about the appearance and evolution of odontodes during early vertebrate evolution is firmly rooted in the classic problem of anatomical homology. Page 809

4. The Endothelin System, By Ingo Braasch
Several models have been proposed to explain the emergence of the neural crest in vertebrates and its evolutionary origin is matter of an ongoing **debate** (reviewed in Donoghue et al. 2008). Page 784

5. Context-Dependent Mutation Rates, By Ryan D. Hernandez
Isochores appear to have entered vertebrate genomes; 310–350 MYA (Bernardi et al. 1997), but there is still considerable **debate** regarding their formation and which evolutionary forces are actingtomaintain them (Bernardi 2000; Fryxell and Zuckerkandl 2000; Meunier and Duret 2004). Page 2196

6. 500-Myr-Old Syntenic Block, By Wei Wang
The nature of the last common ancestor of vertebrates is of enormous research interest. This area of interest has been rigorously researched in the past and present. Knowledge in this area has increased steadily, which, in the not too distant time, we hope to understand in the evolution process. Page 784

References

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2. Vertebrate neural crest, By Gerhard Schlosser, Bio Essays, 2008, Volume 30, Pages 659–672

3. The odontode explosion, By Gareth J. Fraser, Bio Essays, 2010, Volume 32, Pages 808–817

4. The Endothelin System, By Ingo Braasch, Molecular Biology And Evolution, 2009, Volume 26, Number 4, Pages 783–799

5. Context-Dependent Mutation Rates, By Ryan D. Hernandez, Molecular Biology And Evolution, 2007, Volume 24, Number 10, Pages 2196–2202

6. 500-Myr-Old Syntenic Block, By Wei Wang, Molecular Biology And Evolution, 2007, Volume 24, Number 3, Pages 784–791

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