

P013 The evolutionary history of PLUNCs: SPLUNC1 and LPLUNC1 evolved in primitive mammals before the monotreme–theria divergence
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PLUNC proteins make up the largest branch of the LPS-binding protein bactericidal/permeability-increasing protein (LBP/BPI) protein family of lipid transfer proteins. We have shown these genes are restricted to vertebrates, are encoded on a single gene locus and yet are highly divergent, as a result of rapid molecular evolution. SPLUNC1 and LPLUNC1 are amongst the most highly expressed genes in the pulmonary epithelium and we have hypothesised that the proteins function in innate defence. Our analysis of this gene family in vertebrates shows that the PLUNC branch is absent from fish and present in amphibians, birds, monotremes and marsupials. We have identified and cloned eleven PLUNC/BPI genes in chickens. Six, including the chicken BPI orthologue, are present in locus on chromosome 20. Orthologues of SPLUNC1 and LPLUNC1 are absent from chickens. The platypus and opossum genomes both contain SPLUNC1 and LPLUNC1 and both were cloned from opossum lung/trachea by RT-PCR. Although the wider PLUNC/BPI gene family is present in vertebrates the two proteins most significantly expressed in the respiratory tract (and the highly divergent SPLUNC sub-branch of the family) appear to have evolved in primitive mammals before the monotreme–theria divergence.