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Targeting mast cell function with splice-switching oligonucleotides

Research emphasis:

My research focuses on mast cell activation and signaling pathways and their contribution to the pathophysiology of allergic diseases and mastocytosis. Using splice-switching anti-sense oligonucleotides (SSOs) to elucidate gene and protein functions, I am investigating the underlying molecular mechanisms of mast cell activation, survival and proliferation, and the therapeutic potential for SSOs in the treatment of mast cell-driven diseases.

Applications:

- Human mast cells
- Exon splice-switching
- Allergy and asthma
- Cell signaling

Research Strengths:

- Antisense oligonucleotide design
- IgE-mediated mast cell activation and signaling assays
- *In vitro* transfection and transduction
- Primary human mast cell isolation and culture

Publications and Abstracts:

Cruse G, Yin Y, Fukuyama T, Desai A, **Arthur GK**, Baumer W, Beaven MA, Metcalfe DD. Exon skipping of FcεRIβ eliminates expression of the high affinity IgE receptor in mast cells with therapeutic potential for allergy. *Proc Natl Acad Sci USA*, 2016; 113(49): 14115-20

Arthur GK, Duffy SM, Roach KM, Hirst RA, Shikotra A, Gaillard EA, Bradding P. KCa3.1 K⁺ channel expression and function in human bronchial epithelial cells. *PLoS One* 2015; 10(12): e0145259

Martin N, Ruddick A, **Arthur GK**, Wan H, Woodman L, Brightling CE, Jones DJ, Pavord ID, Bradding P. Primary human airway epithelial cell-dependent inhibition of human lung mast cell degranulation. *PLoS One* 2012; 7(8): e43545