**Negative Regulation of Eosinophil Production by TLR4 Agonists**

**Brief Description of Technology**
Exposure of eosinophils to TLR4 agonists (LPS) is a novel therapeutic method for inhibiting eosinophilia in eosinophilic diseases.

**Technology ID**
2011-0604

**Technology Overview**
It has long been known that eosinopenia is observed during acute bacterial infection, yet the mechanism remains undefined. Dr. Rothenberg’s team investigated the consequence of exposure to microbial products, specifically bacterial lipopolysaccharide (LPS), on eosinophil production and have shown that developing murine eosinophils transiently express mRNA for six Toll-like receptors (TLRs), including TLR5, throughout eosinophil development and nearly undetectable levels on mature eosinophils. LPS stimulation of eosinophil progenitors ex vivo markedly inhibited IL-5-mediated cellular proliferation and expansion. Further, LPS administration in vivo reduced numbers of eosinophil progenitors in the bone marrow and blood of mice. Notably, LPS effectively reduced eosinophilia even in hypereosinophilic mice induced by the IL-5 transgene. Taken together, these findings identify a mechanistic explanation for eosinopenia following bacterial infections. Dr. Rothenberg’s team has identified TLR4 agonists as novel therapeutics for depleting eosinophil progenitors and inhibiting peripheral eosinophilia in eosinophil-associated diseases.

**Applications**
- Therapeutic treatment of eosinophilia and eosinophilic diseases

**Advantages**
- Broadly applicable to a wide range of eosinophilic diseases
- LPS and related products are easily obtained, and exist in forms approved for use in humans
- Remaining eosinophils remain functionally intact

**Market Overview**
Eosinophilic disorders range from the very common, such as asthma and atopic dermatitis, which affect nearly 8% and 9-30% of the US population respectively, to rare diseases such as eosinophilic gastroenteritis (10/100,000) and hypereosinophilic syndrome.

**Investigator Overview**
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