Title: Therapeutic use of compliment modulators to prevent or reduce the risk of recurrent miscarriages

The therapeutic use of a novel mAb for inhibiting compliment factor B to prevent or reduce the risk of miscarriages

Problem / Unmet need: Up to 3% of women suffer recurrent miscarriages. There is a critical need for therapeutic interventions to prevent or reduce miscarriages because:

- The incidence rates for neonatal death have not decreased in 3 decades
- The cause of neonatal deaths in 50-60% of cases remains unknown
  
  *Recurrent miscarriages may be triggered by the maternal immune response, but the mechanisms remain unclear*
- Immunomodulatory treatments to prevent neonatal loss have had limited success and are not endorsed by professional Obstetrician and Gynecological Societies
- Women with antiphospholipid antibody syndrome (APS) are at risk for recurrent miscarriage, but there is no effective treatment for this condition
- Antiphospholipid antibodies (aPL) are not a reliable therapeutic target for preventing miscarriage in women with APS
- The cost of caring for conditions commonly associated with neonatal loss are estimated to be $5-6B USD annually

Details of the Invention: Using murine models of spontaneous recurrent miscarriage, we have developed a therapeutic agent that can prevent or reduce the risk of pregnancy loss:

- Compliment activation is an effector in recurrent spontaneous miscarriages
- We show that modulating compliment mediators C3, C5, C5a, or factor B reduced fetal loss in murine models of aPL-induced fetal injury
- We generated a novel mAb to mouse factor B that specifically targets the alternative compliment pathway
- Therapeutic administration of the anti-factor B mAb prevented fetal loss in murine models of aPL-induced miscarriage

Advantages:

- Modulating compliment activation provides a targeted approach for reducing miscarriages in high risk women
- Targeting the compliment pathway has been used or proposed for treating a variety of clinical conditions including rheumatoid arthritis and post-acute myocardial infarctions
- Anti-compliment agents that target C3 and C5 have been developed for treating other indications in humans andC5 inhibitors have proven to be safe and are in phase II clinical trials
- Targeting the alternative compliment pathway with an anti-factor B antibody is a superior approach to targeting C3 or C5 as it allows the classical pathway to remain fully functional
- Specific targeting of the alternative pathway poses less risk of serious infection than inhibiting the classical pathway, which is more critical for fighting infections
- Screening for agents that can modulate complement activation will identify additional therapeutics for treating miscarriages

Patent status: provisional

Further information: Please contact the Office of Technology & Intellectual Property Development

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