# G4, a new transgenic mouse model for polycystic ovaries syndrome

*Mostafa Esmael, Canada.*

**Abstract**

Polycystic ovary condition (PCOS) is a hormonal issue basic among ladies of regenerative age. Ladies with PCOS may have inconsistent or drawn out menstrual periods or overabundance male hormone (androgen) levels. The ovaries may build up various little assortments of liquid (follicles) and neglect to routinely discharge eggs.

The specific reason for PCOS is obscure. Early analysis and treatment alongside weight reduction may lessen the danger of long haul entanglements, for example, type 2 diabetes and coronary illness.

Indications

Signs and indications of PCOS regularly create around the hour of the primary menstrual period during pubescence. Once in a while PCOS grows later, for instance, in light of significant weight gain.

Signs and side effects of PCOS shift. A finding of PCOS is made when you involvement with least two of these signs:

Sporadic periods. Rare, unpredictable or delayed menstrual cycles are the most well-known indication of PCOS. For instance, you may have less than nine periods every year, over 35 days among periods and strangely substantial periods.

Overabundance androgen. Raised degrees of male hormone may bring about physical signs, for example, abundance facial and body hair (hirsutism), and at times extreme skin break out and male-design hairlessness.

Polycystic ovaries. Your ovaries may be expanded and contain follicles that encompass the eggs. Thus, the ovaries may neglect to work consistently.

PCOS signs and side effects are ordinarily progressively extreme in case you're stout. PCOS has become one of the most common endocrine disorders and recently it has been observed that diet, genetics and lifestyle are the major contributors to the onset and progression of PCOS. Trends are alarming towards various metabolic diseases such as obesity, hypertension, diabetes, insulin resistance, iron disorders, visceral adiposity, musculoskeletal disorders and many more. Polycystic ovary syndrome (PCOS) is the number one cause of female infertility. Some mouse models are available to study it. These models are generated by different methods (mainly via administration of dihydrotestosterone) because its origin is not fully understood. A genetic cause has not been confirmed yet. Via insertional mutagenesis, we identified a new gene (*Gm10800*), which when disrupted in mice appears to phenocopy human PCOS. We are currently characterizing this transgenic mouse model (G4) and validated it as a PCOS model and studyingthe link between *Gm10800* and the observed phenotypes (Obesity and sub-fertility).

The main features of this model are:

• Obesity with associated abnormalities such as glucose and insulin intolerance, polyphagia, high leptin levels, and lipid deposition in the ovaries.

• Sub-fertility associated withcysts in the ovaries, di-estrous arrest, high percentage of non-viable oocytes, and high levels of LH, estrogen and testosterone.

The gene disrupted by transgenic insertion (*Gm10800*) appears to be the mouse ortholog of a human gene known as *PIRO*(*progranulin-induced receptor-like gene during osteoclastogenesis*). There is a single paper that discusses this gene, suggesting a rolefor it in the formation ofosteoclasts. In accordance with this, our

preliminary MicroCT analyses of bone mass density show that transgenic mice have greater bone mass than controls. Ongoing work is aimed at determining how *Gm10800/PIRO*contributes to the observed phenotypes.

In conclusion, the G4 mouse model points to a direct link between PCOS and a gene for the first time. It's also the most representative model of PCOS currently available. This makes it anextremely valuable model to better understand the disease and the mechanism of action of some existing medication for it like metformin. It also gives us a precious chance to test new drugs on this model like endoplasmic reticulum stress inhibitors that are already in the drug market for other diseases, like TUDCA.