Supplementary Table SIV **Summary of identified genes that may contribute to the onset of premature menopause.**

Gene ID	Gene locus	Protein function	Possible connection to premature menopause phenotype	Association with other phenotypes	References
FMN2	1q43	Involved in cytoskeletal organization and the establishment of cell polarity.	KO mice have decreased fertility and abnormal metaphase spindle position and the first polar body formation during Meiosis I.	–	Leader *et al.* (2011)
ALMS1	2p13.11	Involved in microtubule organization	*ALMS1* is widely expressed in reproductive tissues.	Alström syndrome	Marshall *et al.* (2007)
SGOL2	2q33.1	Protects centromeric cohesion from premature separase-mediated cleavage in oocytes specifically during Meiosis I.	KO mice are infertile.	–	Llano *et al.* (2008)
PSMB1	6q27	Cleavage of peptide bonds with very broad specificity.	Dysregulation of proteasome subunit β1 expression is associated with primary Sjörgen's syndrome that can affect female fertility.	Primary Sjörgen's syndrome	Martinez-Gamboa *et al.* (2013)
TBP	6q27	The core component of promoter recognition factor—TFIID.	Proper TBP levels in the oocytes and zygotes are necessary for the normal development.	–	–
BBS9	7p14.3	Involved in parathyroid hormone action in bones.	Association of the gene has been reporter previously in POF patients.	Bardet-Biedl Syndrome 9	Nishimura *et al.* (2005) and Kang *et al.* (2008)
OGN	9q22.31	Induces ectopic bone formation in conjunction with transforming growth factor beta.	Expressed in numerous tissues, including ovary, endometrium and pituitary gland, dysfunction of which, may lead to disorders of reproductive system.	–	–
CENPP	9q22.31	Essential for proper kinetochore function and mitotic progression.	Impaired mitotic division during gametogenesis can reduce the starting follicle pool.	–	–
SYCE1	10q26.3	Major component of the transverse central element of synaptonemal complexes (SCS), formed between homologous chromosomes in meiotic prophase.	Impaired repair of meiotic double-strand breaks may induce germ-cell loss. Gene has been previously associated with POF.	–	McGuire *et al.* (2011)
SCARB1	12q24.31	Plasma membrane receptor for high density lipoprotein cholesterol (HDL) that mediates cholesterol transfer to and from HDL.	KO mice have abnormal HDLs, ovulated dysfunctional oocytes, and are infertile. Over-production might lead to abnormal lipoprotein metabolism that can contribute to some form of human female infertility.	–	Miettinen *et al.* (2001)
CPEB1	15q25.2	Involved in cell proliferation and tumorigenesis.	KO mice have vestigial ovaries devoid of oocytes.	–	McGuire *et al.* (2011)
BNC1	15q25.2	Involved in germ-cell differentiation.	In knock-out mice the oocyte morphology is affected, which leads to female subfertility.	–	Ma *et al.* (2006)
ERCC4	16p13.12	Involved in homologous recombination that assists in removing interstrand cross-link.	Expressed in many tissues, including female reproductive tract.	–	–
LHX1	17q12	Transcription factor important for the development of the renal and urogenital systems.	Deletion and gene mutations cause Müllerian agenesis. Overexpression may lead to endometrial hyperplasia with high levels of estrogen, potentially affecting oocyte production or follicle maturation.	Müllerian agenesis	Ledig *et al.* (2010b)
ARFGAP3	22q13.2	Small G-protein that regulates a wide variety of processes in the cell.	Androgen-target gene; expressed in endocrine gland, including ovary (although six-times higher in testis). In bovines may contribute to follicular growth, ovulation, and/or luteinization.	–	Ndiaye *et al.* (2005)

Continued

Supplementary Table SIV *Continued*

Gene ID	Gene locus	Protein function	Possible connection to premature menopause phenotype	Association with other phenotypes	References
STS	Xp22.31	Catalyzes the conversion of sulfated steroid precursors to estrogen during pregnancy.	Overexpression of the gene may lead to abnormal levels of estrogen with potentially deleterious effect on LH and FSH production thus contributing to POF.	–	Quilter *et al.* (2010)
AR	Xq12	A steroid hormone receptor, suggested to be involved in folliculogenesis in females.	KO mice display a POF-like phenotype; altered CAG repeats in the *AR* gene have been reported in POF patients.	Androgen insensitivity; PCOS	Azziz *et al.* (2009)

KO, knock-out; PCOS, polycystic ovary syndrome; POF, premature ovarian failure.