# Follicular Anti-Müllerian Hormone (AMH) as a Predictor for Embryo Grading and Clinical Pregnancy in Patients Undergoing In Vitro Fertilization (IVF)

#### Thesis

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قياس الهرمون المضاد لعامل المولييرين في المحلول الحويصلى للمبيض كوسيله للتنبؤ في تصنيف الأجنة وحدوث حمل اكلينيكي في حالات العقم المعالجة بالإخصاب المعملى ونقل الأجنة

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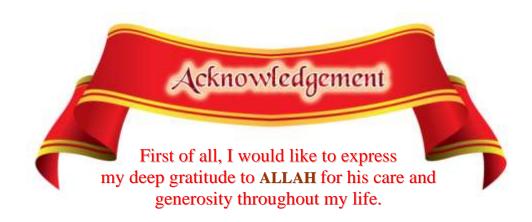
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## List of Abbreviations

Abb.	Full term
AFC	Antral Follicle Count.
AMH	Anti-Müllerian hormone.
AMHR	Anti-Müllerian hormone receptor.
ART	Assisted reproductive technologies.
BMI	Body mass index.
BMPs	Bone morphogenetic proteins.
CA	Cancer antigen.
CC	Clomiphene Citrate.
CD 3	Cycle day 3.
СОН	Controlled ovarian hyperstimulation.
COS	Controlled ovarian stimulation.
D3EQ	Day 3 embryo quality.
DFC	Dense Fibrillar Component.
d-OPU	Day of ovum pick up.
DOR	Diminished ovarian reserve.
E2	Estradiol.
FASTT	Fast tract and standard treatment.
FBC	Full blood count.
FC	Fibrillar Center.
FF	follicular fluid.
FF-AMH	Follicular fluid Anti-Müllerian hormone.
FP	Fragmentation pattern.
FSH	Follicle stimulating hormone.
GC	Granular Component.

GnRH Gonadotrophin-releasing hormone.

GnRH-a Gonadotrophin- releasing hormone agonist.

GnRH-nt Gonadotrophin-releasing hormone

antagonist.

HCG Human chorionic gonadotrophin.HH Hypogonadotrophic hypogonadism.HMG Human menopausal gonadotrophins.

HMG-HP Human menopausal gonadotrophins highly

purified.

ICSI Intracytoplasmic sperm injection.

IUI Intrauterine insemination.

IVF-ET In Vitro Fertilization – Embryo Transfer.

LH Leutinizing hormone.

MFD Multiple follicular development.

MIF Müllerian inhibiting factor.

MIH Müllerian-inhibiting hormone.

MIS Müllerian-inhibiting substance.

MOV Mean ovarian volume.

NICE National Institute Health and Clinical

Excellence.

NPBs Nucleolar precursor bodies

OHSS Ovarian hyperstimulation syndrome.

OI Ovulation induction.

PCOS Polycystic ovarian syndrome.

pFSH Purified follicle stimulating hormone.

PRL Prolactin.

rFSH Recombinant follicle stimulating hormone.

rLH Recombinant leutinizing hormone.

ROC Reciever operating characteristics.

SMAD Signaling mothers against decapentaplegic

homolog proteins to regulate cellular

functions.

TGF- $\beta$  Transforming growth factor  $\beta$ .

TMX Tamoxifen.

TSH Thyroid stimulating hormone.

Ufsh Urinary follicle stimulating hormone.

uFSH-HP Urinary follicle stimulating hormone

highly purified.

WHO World Health Organization.

WHO-IRP World Health Organization Second

International Reference Preparation

Z-Score Zygot scoring.

#### **INTRODUCTION**

Anti-Müllerian hormone (AMH) or Müllerian-inhibiting substance (MIS) is a glycoprotein hormone of the transforming growth factor beta (TGF-β) family with a molecular weight of 140 kilodalton. AMH is produced as a precursor and undergoes glycosylation or cleavage to form the mature molecule. AMH activity was localized to the immature sertoli cells from the time of fetal sex differentiation to puberty in the testis and to the granulose cells of postnatal ovary to the end of ovarian activity. The knowledge of the normal and pathological expression of AMH and the regulatory mechanisms involved encouraged scientists to study its clinical implications (*Appasamy and Muttukrishna*, 2008).

Several studies have recently investigated the circulating levels of AMH throughout the menstrual cycle. Most studies have reported that AMH levels do not alter significantly throughout the cycle whereas one recent study reports a significant rise in AMH in the late follicular phase compared to ovulation and early luteal phase of the cycle (*Wunder et al.*, 2007).

The specific expression pattern of AMH in growing follicles has prompted us and others to investigate whether AMH levels are indicative for the size of the growing follicle pool. The quantitative aspect of ovarian aging is reflected by a