Medical Andrology Unit
University Hospital of L'Aquila
67100 Coppito, L'Aquila, Italy

CENTRE REPORT

History of Centre

Andrology in L'Aquila is a more than 30 years experience. Among the scientific events organized in L'Aquila in this area, is worth mentioning the International Congress "Oligozoospermia: Recent progress in Andrology", held in 1980; this was a key event in promoting Andrology as new basic and clinical medical science. Twenty years later L'Aquila hosted the European Academy of Andrology (EAA) "1st European Congress of Andrology, March 2000".

The "**Complex Unit of Medical Andrology**" of the University Hospital of L'Aquila was instituted in 2000. A bank for male gamete cryopreservation is operative since 2003. The Unit was certified as EAA training centre in 2005 (see report in Int J Androl 2006 vol.29, supplement 1, pag. 154-159), and since 2008 it was certified as Regione Abruzzo reference centre for Andrology and Male Gametes Cryopreservation.

Clinical Activities

1. Andrology Clinic: The Medical Andrology Unit is mainly active in the evaluation and management of infertile patients and those with sexual dysfunctions. Patient with primary or secondary hypogonadism, boys with delayed puberty and patients with other endocrine diseases are also seen.

2. Seminology laboratory:

Conventional semen analysis is performed according to the World Health Organization recommended procedures (2010). IgG-MAR-test is performed as screening test for immunological infertility, on all ejaculates in the contest of the standard semen analysis. In the presence of a positive IgG-MAR-test, IgA-MAR test is also performed in the same ejaculate, and sperm-agglutinating activity is titrated in serum and seminal plasma. Laboratory participates to external quality assessment for semen analysis UK NEQAS (Birmingham).
Sperm DNA fragmentation is assessed with TUNEL test using cytofluorimetry.

Post Coital Test (PCT) is performed to assess "in vivo" sperm-cervical mucus interaction.

Sperm processing for intrauterine inseminations (IUI): Swim-up or minipercoll with Pure Sperm.

Ultrastructural semen analysis is carried out with transmission electron microscope (TEM) (facilities at Centre of Microscopy, University of L'Aquila) in case of total or near total immotility associated to sperm vitality > 50%. Aim of TEM analysis is to recognize cases of absent or severely reduced forward motility of genetic origin (Primary Cilia Diskinesia or Dysplasia of the Fibrous Sheet).

For research purpose
Computer assisted semen analysis (CASA)
Cytofluorimetry *(mitochondrial potential, lipid peroxidation, Tirosyne-phosphorilation, mitochondrial ROS production, caspase activation, leucocytes and cultured cells characterization, antibody load on sperm surface quantification).*

3. Centre for male gamete cryopreservation

A bank for male gamete cryopreservation, one of the 2 public banks in central Italy, is operative since 2003. Sperm cryopreservation is offered mainly to patients with malignant diseases before

chemotherapy or radiotherapy but also to patients with severe oligozoospermia or intermittent presence of motile spermatozoa in the semen (as backup for ICSI), to patients with hypothalamo-pituitary hypogonadism after gonadotrophin treatment and to patients undergoing pelvic surgery.
Cryopreservation of testicular sperm is also routinely performed after TESE.

4. Penile vibratory stimulation (PVS) in cord injured men for semen evaluation and/or cryopreservation.

5. Ultrasonography: Ultranonographic evaluations are performed with a duplex scanner equipped with colour flow imaging (General Electric, Healthcare, WI, USA).
Scrotal color-Doppler ultrasound (CDU) as diagnostic tool in patients with poor semen quality, in those with an increased risk of malignancy and in those with an evidence of varicocele at physical examination. Penile CDU, 10 and 30 minutes following intracavernous injection of 10 µg of the vasoactive drug prostaglandin $E_{1,}$ is offered to men with erectile dysfunction associated to vascular diseases or vascular risk factors. This is also offered in men with Peyronie's disease. This is associated to ultrasound determination of common carotid arteries intima-media thickness as an objective evaluation of preclinical atherosclerosis of large arteries. Trans-rectal CDU as a diagnostic tool in patients with azoospermia or severe oligozoospermia to screen possible obstructions of the distal seminal tract. This is also offered in men with persistent leucocytospermia or possible prostate-vesciculitis after general and physical examination. Transvaginal sonography is performed to monitor follicular development and ovulation for Post Coital Test (PCT) or omologous intrauterine insemination timing.

6. TESE in azoospermic men is performed by Andrology Unit staff under local anesthesia at out-patient surgery facilities. An incision is made on the tunica albuginea in the medial or lateral aspects of the upper pole of the testis and 3 to 4 consecutive specimens, 0.1 – 0.2 g. each, are sampled and placed in a sterile plastic tube and immediately transferred to laboratory for sperm extraction and for histology.

7. Omologous intrauterine insemination (IUI) with mild ovarian stimulation is performed from more than 30 years in the Andrology Unit. Gynecological support is provided by gynecologists of IVF clinic.

Local collaboration with other institutions

L'Aquila University Hospital: *Clinical pathology Service* for Hormonal determinations and bacterial colture of semen, including search for clamydia and Uraplasma Ur in uretral swab and molecular genetic tests; *Medical Genetics Unit* for cytogenetic tests; *Urology Unit,* for Surgical Andrology; *Unit of Operative Radiology* for scleroembolization of spermatic vein; *ART centre* and *Obstetrics and Gynaecology Unit; Paediatric Unit* for handling young boys with defects of hypothalamus-pituitary-gonadal axis.

Centre for Clinical Research, San Raffaele Sulmona: *Spinal Cord Unit*, for the management of sexual dysfunction and infertility of cord injured men.

Educational activities

Postgraduate School of Endocrinology. In 1981 a Postgraduate School of Andrology was instituted at the University of L'Aquila. In 1986 it was replaced by the Postgraduate School of Endocrinology. Postgraduate students spend the last 2 years of the course in the Andrology Unit.

Teaching of Andrology and sexual medicine in the course of "obstetrics and gynecology, sexual and reproductive medicine" for medical students at the University of L'Aquila.

Pre-graduate course of Andrology for students of Biotechnologies of Reproduction at the University of Teramo (professional training in andrology at the Andrology Unit of L'Aquila)

Course on Management of Male Infertility (*2013, February).* A 2 days Course reserved to 80 doctors from different area of Russia Federation, actively involved in Andrology clinics, and selected by FARMAMED, a pharmaceutical institution of Russia.

MASTER in Quality Management and Safety in Handling and Storage of Human Cells and Tissues *(2012-2013 and 2013-2014)*

Postgraduate course in Quality Management and Safety in Handling and Storage of Human Cells and Tissues *(2014)*

Research activities

Erectyle dysfunction

Continuing our traditional research on the relationship between erectile dysfunction (ED) and cardiovascular risk, we have focused our attention on endothelium repair mechanisms by measuring in vitro the clonogenic potential and the differentiation of circulating angiogenic cells (CACs). We have studied these parameters in subjects with ED with or without vascular risk factors (VRF) and the role of phosphodiesterase-5 inhibitors on CACs and endothelial function in subjects with ED (***Atherosclerosis 2008,*** 196:313-19*;* ***Int J Androl 2012***, *35:645-52;* ***Asian J Androl 2014,*** 16:290-4). Molecular mechanisms involved in the inhibition of CACs in subjects with ED have been investigated (***J Sex Med 2016,*** 13:1063-70*).* The psychological correlates of ED have been analyzed both in subjects with DE and VRF (***Int J Impot Res 2007,*** 19: 597-601***; Int J Androl 2009,*** *32:74-80)* and in spinal cord injured men (***J Sex Med 2012,*** 9:830–36).

Male infertility

Interest has been focused on clinical correlates of asthenozoospermia ranging from the study of the spontaneous variability of seminal parameters in infertile subjects (***Int J Androl 2007,*** 30:174-81) to the presence and characterization of macrophages in ejaculate and more in general of the relationship between ejaculate leucocytes and sperm pathophysiology (oxidative stress, DNA damage, apoptosis) (***Int J Androl 2009,*** 32:623-28; ***Fertil Steril, 2011,*** 95: 2676-79; ***Andrology 2016,*** 4:808-15). Studies have been also carried out on the relevance of both morphological and functional mitochondrial modifications

in spermatozoa of subjects with asthenozoospermia (***Fertil Steril*** 2011, 95: 641-46; ***Fertil Steril***, 2011, 95: 2315-19) and on ultrastructural characterization of sperm tail defects of genetic origin (***Fertil Steril 2006***, 85, 940- 946; ***Hum Reprod., 2008*** (4): 996-1001, ***Hum Reprod., 2008***, 23 (8): 1957-1962). A cross-over study on the efficacy of intrauterine insemination in oligo-astheno-terato-zoospermia and in male immunological infertility was also carried out (***Fertil Steril 2009***, 92: 1009-11). Expertise in the field of immunological infertility is documented by the bublication of various reviews by invitation (***Front Biosci 2007***, 12: 2890-911; MALE AUTOIMMUNE INFERTILITY In: WKH Krause & RK Naz: ***IMMUNE INFERTILITY***, Ed. Springer-Werlag, Berlin pp.145-153, 2009, and an updated 2° edition in 2017; ***INFERTILITY: IMMUNLOGICAL ASPECTS In: eLS,*** JohnWiley & Sons, Ltd: Chichester, 2012). Attention has been also focused on the clinical significance of epididymal ultrasound in the diagnosis of excretory and secretory azoospermia, and in oligozoospermia (***Andrology, 2013***; 1: 133-8; ***Hum Reprod. 2014***; 7: 1368-74).

Physiology and physiopathology of human spermatozoon

Topics addressed: the dynamics of tyrosine phosphorylation during capacitation in relation to the acquisition of the fertilizing capacity of the sperm (***Biol Reprod 2008***, 79: 649-56; ***Asian J Androl 2010***, 12: 853-61); the potential role of the chemokine system (***Mol Hum Reprod 2008,*** 14:387-91; ***HumReprod 2009***, 24:2979-87); we have also shown that human spermatozoon exhibits a complete functioning endocannabinoid system related to enandamide (AEA) and that AEA binding the TRPV1 receptor is involved in the acquisition of sperm fertilizing ability (***Endocrinology 2009***, 150:4692-700). Furthermore,we demonstrated that the activation of CB1 induces a reduction of the mitochondrial membrane potential, the motility reflexes of which can be highlighted only under glycolysis block: this help to shed light on the relationship between sperm motility and energy metabolism (***Endocrinology 2010***, 151:5882-92).

We also demonstrated: the involvement of mitochondrial dysfunction in the depressive effect on sperm motility exerted by the seminal plasma of patients with spinal cord injury- SCI (***Andrology 2013***,1: 456-63); the protective role of lactobacilli on sperm lipid peroxidation (***FertilSteril 2011,*** 95: 2485-8; ***PLoS One 2013***, 8: e83136); the involvement of the cannabinoid receptor 1 (CB1) in sperm mitochondrial depolarizing effect of lipopolysaccharide (***Andrology 2014***, 2:502-9).

Hypogonadism and other endocrine abnormalities in men with spinal cord injury (SCI)

In men with SCI we investigated the correlates of the biochemical hypogonadism, which is highly prevalent in this category of patients (***Andrology 2014***, 2:721-8); we also demonstrated an independent association of low testosterone levels with low levels of 25 (OH)-vitamin D (***J Spinal Cord Med 2016,*** 39: 246-52) and with non-alcoholic hepatic steatosis (***J Spinal Cord Med 2016***, 25:1-7); an independent association of 25 (OH) -vitamin D with physical function (***Arch Phys Med Rehabil 2016***, 97:726-32).

Name and address of Centre

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Ospedale Civile San Salvatore
Università di L'Aquila
67100 Coppito, L'Aquila, Italy
Tel: +39 862 368338
Fax: +39 862 368342

Type of Centre

University	
University Hospital	x
Private Centre	

Other (please specify) _____

1. Director Felice Francavilla

3. Present Staff *(Senior Scientists)*

1) Name Felice Francavilla
Degree Associate professor
Speciality Endocrinology

Academician [x] Affiliated Member [ ] Clinical Andrologist [ ]

2) Name Sandro Francavilla
Degree Associate Professor
Speciality Endocrinology, Andrology

Academician [x] Affiliated Member [ ] Clinical Andrologist [ ]

3) Name Carla Tatone
Degree Associate professor
Speciality Biologist

Academician [ ] Affiliated Member [ ] Clinical Andrologist [ ]

Insert any additional staff below *(if required)*

MD/Biologists/Chemists

1) Name Giuliana Cordeschi
Degree Biologist
Speciality
Full time

Academician [ ] Affiliated Member [ ] Clinical Andrologist [ ]

PhD Students

1) Name Giovanna Di Emidio, PhD, Post doc Position
2) Name Giulia Rossi PhD Student in Molecular and Cellular Biotechnology

Nurses

1) Name Roberta Bruno
2) Name Anna Spaziani

Insert any additional staff below *(if required)*
Prof. Carla Tatone, Biologist
For each staff category please specify changes (increased or decreased since last EAA site visit

Physicians

Unchanged [x] Increased [ ] Decreased [ ]
Please specify _____ Please specify _____

Nurses

Unchanged [x] Increased [ ] Decreased [ ]
Please specify _____ Please specify _____

Laboratory Technicians

Unchanged [x] Increased [ ] Decreased [ ]
Please specify _____ Please specify _____

Administrative Personnel

Unchanged [x] Increased [ ] Decreased [ ]
Please specify _____ Please specify _____

Overall comment – is personnel staff enough for centres activities?

Yes [x] No [ ] Further comment _____

4. Clinical Activity

A. *Outpatients: Consultations per year in the last 3 years*

	2013	2014	2015
New patients	1182	1247	. 1247
Controls	971	1227	1560

Type of patients in the last years (%)	2013	2014	2015
Infertility	35	35	35
Erectile dysfunction	35	35	35
Hypogonadotropic Hypogonadism	<1	<1	<1
Klinefelter	1	1	1
Gynaecomastia			
Varicocele			
Cryptorchidism			
Male sex accessory gland infections			
Testicular tumours	<1	<1	<1
Disorders of gender identity	<1	<1	<1
Other	30	30	30

B. Ultrasound (testis, penile, prostate)

	2013	2014	2015
total	……302	319	317
Controls			

C. Andrological surgery procedures

	2013	2014	2015
Testicular biopsies	15	17	25
Varicocele ligation			
Prostate biopsies			
BPH			
Prostate cancer			
Vasectomy			
Vaso-vasostomy			
Other			

5. A. Andrology laboratory activity

	2013	2014	2015
Semen analyses + MAR test	1142	883	844
Sperm antibodies			
Seminal markers			

5. B. Andrology laboratory activity

Sperm banking donors	Yes		No	X
Sperm banking cancer patients	Yes	X	No	

If yes:			
	2013	2014	2015
Number of samples	61	50	85

5. C. Hystopathologial evaluation of biopsies	Yes	X	No	
5. D. Reproductive Hormones Assays	Yes		XNo	

If yes please specify type of assays and number of samples in the last year

5. E. Y chromosome microdeletions according to EAA/EMQN guidelines — Yes [ ] No [X]

If yes number of tests in the past year: 11

Participation to the EAA quality control scheme? Yes [ ] No [ ]

If no, specify if available in another lab of the same hospital Yes [ ] No [X]

Blood karyotyping Yes [ ] No [X]

If no, specify if available in another lab of the same hospital Yes [X] No [ ]

Other genetic tests (please specify)

6. Collaborations with other Clinical Units of the University/Hospital

IVF Unit Yes [X] No [ ]

If yes please specify: Children, Endocrinology, IVF, Urology, Genetics, Pathology

Urology Clinic Yes [X] No [ ]

Endocrine Clinic Yes [X] No [ ]

Genetics Lab/Unit Yes [X] No [ ]

Paediatric Unit Yes [X] No [ ]

Central Hospital Laboratory Yes [X] No [ ]

Private Centres Yes [ ] No [X]

If yes please specify:

7. Clinical teaching activity

Duration of training (years): 2 years of Reproductive Medicine and Andrology out of 5 years of Postgraduate School of Endocrinology)

	Number
A: Trainees in the last five years (Postgraduate School of Endocrinology)	5
B: Trainees who passed EAA-ESAU\exam for Clinical Andrologist in the last 5yrs	1
C: Trainees working in the centre preparing to pass the EAA-ESAU examination	1
D: Ph D Students	1
E: Medical Students: Andrology in the course of "obstetrics and gynecology,	80/yr

sexual and reproductive medicine	
F: Other students: –Course of Andrology: Degree in Biotechnologies of reproduction, Faculty of Veterinary Medicine, University of Teramo)	25/yr

8. Formal Andrology teaching program Yes [x] No [ ]

If yes: specify duration (years/months): Years [ ] Months [ ]

	Hours of formal teaching per year	**Professional training (weeks/months)**
Medical Students	20	1 week
Ph D Students	20	11 months
Post Graduate students	30	11 months
Trainees		
Students of Biotechnologies of reproduction	25	2 week

9. Research Activity

Please list the main papers in peer review journals in the last 3 years with I.F. in a separate file.

10. Research Funding

Please specify the amount of available funds in the last 3 years and their source (Government, European Union, University, Local Government, Pharmaceutical Industries, Banks, Foundations….)

Year Funding from University of L'Aquila to support annual projects in the last 3 years: 20.000 Euro

Year

Total amount (€)

Funding Source(s)

11. Please report the main improvements of the Centre following the (last) EAA site visit

Clinical and laboratory Activity

Inclusion of Prof. Carla Tatone into the staff as biologist supervisor of the Bank for gamete cryopreservation.

Participation from 2013 to external quality assessment for semen analysis **UK NEQAS (Birmingham)**

Research Activity

Teaching

Teaching of Andrology and sexual medicine in the course of "obstetrics and gynecology, sexual and reproductive medicine" for medical students

12. Overall considerations by the Centre Director

A. The centre is growing [X] Is stable [ ] Has problems [ ]

If 'has problems', please specify _____

B. Other Comments by the Centre Director

13. Anticipated future changes in the Centre

List of publications from the EAA-Centre L'Aquila (2013 – 2016)

ANDROLOGY

Barbonetti A, Castellini C, Di Giammarco N, Santilli G, Francavilla S, Francavilla F. In vitro exposure of human spermatozoa to bisphenol A induces pro-oxidative/apoptotic mitochondrial dysfunction. **Reprod Toxicol** *(in press)* **IF 2.3**

Grassi D, Draijer R, Schalkwijk C, Desideri G, D'Angeli A, Francavilla S, Mulder T, Ferri C. Black Tea Increases Circulating Endothelial Progenitor Cells and Improves Flow Mediated Dilatation Counteracting Deleterious Effects from a Fat Load in Hypertensive Patients: A Randomized Controlled Study. **Nutrients**. 2016 Nov 16;8(11). **IF: 3.55**

D'Andrea S, Micillo A, Francavilla F, Di Emidio G, Tatone C, Francavilla S, Barbonetti A. Serum From Patients With Erectile Dysfunction and Vascular Risk Factors Triggered an Oxidative Stress-Dependent Mitochondrial Apoptotic Pathway in Ex Vivo Expanded Circulating Angiogenic Cells of Healthy Men**. J Sex Med**. 2016, 13:1063-70 **IF: 3.15**

Micillo A, Vassallo MR, Cordeschi G, D'Andrea S, Necozione S, Francavilla F, Francavilla S, Barbonetti A. Semen leukocytes and oxidative-dependent DNA damage of spermatozoa in male partners of subfertile couples with no symptoms of genital tract infection**. Andrology**. 2016, 4:808-15 **IF 2.51**

Barbonetti A, Sperandio A, Micillo A, D'Andrea S, Pacca F, Felzani G, Francavilla S, Francavilla F. Independent Association of Vitamin D With Physical

Function in People With Chronic Spinal Cord Injury**. Arch Phys Med Rehabil**. 2016; 97:726-32. **IF 3.045**

Verratti V, Di Giulio C, D'Angeli A, Tafuri A, Francavilla S, Pelliccione F. Sperm forward motility is negatively affected by short-term exposure to altitude hypoxia. **Andrologia.** 2016, 48:800-6. **IF 1.63**

Barbonetti A, Vassallo MR, Felzani G, Francavilla S, Francavilla F. Association between 25(OH)-vitamin D and testosterone levels: Evidence from men with chronic spinal cord injury. **J Spinal Cord Med**. 2016 May;39:246-52. **IF 1.33**

Barbonetti A, Caterina Vassallo MR, Cotugno M, Felzani G, Francavilla S, Francavilla F. Low testosterone and non-alcoholic fatty liver disease: Evidence for their independent association in men with chronic spinal cord injury. **J Spinal Cord Med** 2016; 25:1-7. **IF 1.33**

Barbonetti A, Vassallo MR, Felzani G, Francavilla S, Francavilla F. Association between 25(OH)-vitamin D and testosterone levels: Evidence from men with chronic spinal cord injury. **J Spinal Cord Med** 2016; 39: 246-52. **IF 1.33**

D'Andrea S, Giordano AV, Carducci S, Sacchetti L, Necozione S, Costanzo M, De Gregorio A, Micillo A, Francavilla F, Francavilla S, Barbonetti A. Embolization of leftspermaticvein in non-obstructiveazoospermic men with varicocele: role of FSH to predict the appearance of ejaculated spermatozoa after treatment. **J Endocrinol Invest.** 2015; 38:785-90. **IF 1.994**

Isidori AM, Balercia G, Calogero AE, Corona G, Ferlin A, Francavilla S, Santi D, Maggi M. Outcomes of androgen replacement therapy in adult male hypogonadism: recommendations from the Italian society of endocrinology**. J Endocrinol Invest**. 2015; 38:103-12. **IF 1.994**

Francavilla F, Barbonetti A. Letter to the editor: comment on Gaspar AP, Brandão CM, Lazaretti-Castro M. Bone mass and hormone analysis in spinal cord injury patients: evidences for a gonadal axis disruption**. J Clin Endocrinol Metab.** 2015;100:L20. **IF 6.2**

Isidori AM, Corona G, Aversa A, Gianfrilli D, Jannini EA, Foresta C, Maggi M, Lenzi A; SIAMS-ED Study Group. The SIAMS-ED Trial: A National, Independent, Multicentre Study on Cardiometabolic and Hormonal Impairment of Men with Erectile Dysfunction Treated with Vardenafil**. Int J Endocrinol**. 2014;2014:858715. **IF 2.376**

Barbonetti A, Vassallo MR, Pacca F, Cavallo F, Costanzo M, Felzani G, Francavilla S, Francavilla F. Correlates of low testosterone in men with chronic spinal cord injury**. Andrology**. 2014; 2:721-8. **IF 2.51**

Pezzella A, Barbonetti A, D'Andrea S, Necozione S, Micillo A, Di Gregorio A, Francavilla F, Francavilla S. Ultrasonographic caput epididymis diameter is reduced in non-obstructive azoospermia compared with normozoospermia but is not predictive for successful sperm retrieval after TESE**. Hum Reprod**. 2014; 29:1368-74. **IF 4.569**

Barbonetti A, Vassallo MR, Costanzo M, Battista N, Maccarrone M, Francavilla S, Francavilla F. Involvement of cannabinoid receptor-1 activation in mitochondrial depolarizing effect of lipopolysaccharide in human spermatozoa. **Andrology.** 2014; 2:502-9. **IF 2.51**

Pelliccione F, D'Angeli A, D'Andrea S, Barbonetti A, Pezzella A, Necozione S, Falone S, Amicarelli F, Francavilla F, Francavilla S. Tadalafil treatment had a modest effect on endothelial cell damage and repair ability markers in men with erectile dysfunction and vascular risk. **Asian J Androl.** 2014;16:290-4. **IF 2.596**

Mirone V, Arcaniolo D, Rivas D, Bull S, Aquilina JW, Verze P; PAUSE study team. Results from a prospective observational study of men with premature ejaculation treated with dapoxetine or alternative care: the PAUSE study**. Eur Urol.** 2014; 65:733-9. **IF 14.976**

Festuccia C, Mancini A, Gravina GL, Scarsella L, Llorens S, Alonso GL, Tatone C, Di Cesare E, Jannini EA, Lenzi A, D'Alessandro AM, Carmona M. Antitumor effects of saffron-derived carotenoids in prostate cancer cell models. **Biomed Res Int.** 2014;13:5048. **IF 2.134**

Barbonetti A, Vassallo MR, Cinque B, Filipponi S, Mastromarino P, Cifone MG, Francavilla S, Francavilla F. Soluble products of Escherichia coli induce mitochondrial dysfunction-related sperm membrane lipid peroxidation which is prevented by lactobacilli. **PLoS One**. 2013 Dec 16;8(12):e83136 **IF 3.234**

Barbonetti A, Vassallo MR, Di Rosa A, Leombruni Y, Felzani G, Gandini L, Lenzi A, Necozione S, Francavilla S, Francavilla F. Involvement of mitochondrial dysfunction in the adverse effect exerted by seminal plasma from men with spinal cord injury on sperm motility. **Andrology.** 2013;1(3):456-63. **IF 2.51**

Pezzella A, Barbonetti A, Micillo A, D'Andrea S, Necozione S, Gandini L, Lenzi A, Francavilla F, Francavilla S. Ultrasonographic determination of caput epididymis diameter is strongly predictive of obstruction in the genital tract in azoospermic men with normal serum FSH. **Andrology.** 2013; 1(1):133-8. **IF 2.51**

D'Alessandro AM, Mancini A, Lizzi AR, De Simone A, Marroccella CE, Gravina GL, Tatone C, Festuccia C. Crocus sativus stigma extract and its major constituent crocin possess significant antiproliferative properties against human prostate cancer. **Nutr Cancer** 2013, 65:930-42. **IF 2.241**

FEMALE REPRODUCTIVE BIOLOGY

Nohales-Córcoles M, Sevillano-Almerich G, Di Emidio G, Tatone C, Cobo AC, Dumollard R, De Los Santos Molina MJ. Impact of vitrification on the mitochondrial activity and redox homeostasis of human oocyte. **Hum Reprod**. 2016 May 31. pii: dew130. [Epub ahead of print] PubMed PMID: 27251202. **IF 4.59**

Tatone C, Benedetti E, Vitti M, Di Emidio G, Ciriminna R, Vento ME, Cela V, Borzì P, Carta G, Lispi M, Cimini AM, Artini PG; Italian Society of Embryology, Reproduction and Research (SIERR). Modulating Intrafollicular Hormonal Milieu in Controlled Ovarian Stimulation: Insights From PPAR Expression in Human Granulosa Cells. **J Cell Physiol**. 2015 Sep 2. doi: 10.1002/jcp.25182. [Epub ahead of print] PubMed PMID: 26332656. **IF 3.839**

Tatone C, Di Emidio G, Vitti M, Di Carlo M, Santini S Jr, D'Alessandro AM, Falone S, Amicarelli F. Sirtuin Functions in Female Fertility: Possible Role in Oxidative Stress and Aging. **Oxid Med Cell Longev** 2015;2015:659687. doi: 10.1155/2015/659687. Epub 2015 May 5. Review. PubMed PMID: 26075037; PubMed Central PMCID: PMC4436464. **IF 4.492**

Santonocito M, Vento M, Guglielmino MR, Battaglia R, Wahlgren J, Ragusa M, Barbagallo D, Borzì P, Rizzari S, Maugeri M, Scollo P, Tatone C, Valadi H, Purrello M, Di Pietro C. Molecular characterization of exosomes and their microRNA cargo in human follicular fluid: bioinformatic analysis reveals that exosomal microRNAs control pathways involved in follicular maturation**. Fertil Steril** 2014; 102:1751-61. **IF4.426**

Di Emidio G, Falone S, Vitti M, D'Alessandro AM, Vento M, Di Pietro C,

Amicarelli F, Tatone C. SIRT1 signalling protects mouse oocytes against oxidative stress and is deregulated during aging. **Hum Reprod** 2014; 29: 2006-17.L

IF 4.569