Oncofertility Saturday Academy Poster Abstract Form

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Abstract Categories

Check one only:

☐ **Reproductive Biology** ☐ **In Vitro Fertilization** ☒ **Cancer Biology** ☐ **Oncofertility**

☐ **Other** _____

ABSTRACT TITLE: The Use of Inhibin B and Anti-Müllerian Hormone as a Diagnosis Marker for Granulosa Cell Tumors (GCTs)

AUTHOR: Ephrata Abate

LEARNER OBJECTIVE: Please state the educational objective in a measurable, testable question. Then state what the participant's poster will be able to demonstrate to the viewer(s)/audience.

Question: What are the roles of Inhibin B and Anti-Müllerian Hormone in the diagnosis of GCTs?

The participant will be able to demonstrate: This poster will demonstrate the use of Inhibin B and Anti-Müllerian Hormone as biochemical markers for diagnosis of granulosa cell tumors and differentiation from other type of cancer.

CONTENT (TOPICS): Please provide a brief statement or outline of the content/topic(s) to be presented: Granulosa cell tumors, a type of ovarian cancer, have survival rates higher for patients diagnosed earlier. The hormone inhibin b complimented by anti-müllerian hormone provides an accurate way to detect the disease and postulate optimal patient care.

ABSTRACT: Abstract content should be single spaced, typed using (10-12 pt font) and between 250-300 words. The abstract content should be typed in the space below and **MUST** include the following:

Diagnosis of ovarian cancer is challenging especially when considering the rarity of GCTs. Granulosa cell tumors make up 5-7 percent of ovarian cancer and symptoms are vague and diagnosis and follow up are essential. Inhibin is believed to be the most accurate marker for granulosa cell tumors because, normally, ovarian granulosa cells produce inhibin. In GCTs the serum inhibin levels reflect the size of the tumor. AHM can work with inhibin and be used to differentiate GCTs from patients of endometrioma and other types of cancer. The objective is to validate this information to allow there to be an efficient way for early, accurate, and minimal invasive diagnosis and provide optimal patient care. There have been many studies done to further prove this, including one where inhibin B, AMH, along with human epididymis protein 4 (HE4) and carbohydrate antigen 125 (CA125) were measured in 135 samples from AGCT patients, 37 epithelial ovarian carcinoma (EOC) patients, and 40 endometrioma (ENDO) patients. The levels of the different hormones were recorded using receiver operating characteristic (ROC) graphs, and analyzed by calculating and comparing the area under the curves (AUC) of the different markers. The results showed that the combination of inhibin B and AMH increased the accuracy compared to either marker alone (sensitivity, 100%; specificity, 93%). It was concluded that inhibin B was the most effective single marker for detecting the presence and size of GCT but when differentiating from EOCs and ENDOs, inhibin B was best paired with AMH. In conclusion, research in circulating biomarkers can help improve early diagnosis and narrow the disparity between GCT and other types of cancer; it may even help with monitoring of patients with GCTs and follow ups reducing the risk of relapses.

REFERENCES:

1. Färkkilä, A., Koskela, S., Bryk, S., Alfthan, H., Bützow, R., Leminen, A., Unkila-Kallio, L. (2015). The clinical utility of serum anti-Müllerian hormone in the follow-up of ovarian adult-type granulosa cell tumors-A comparative study with inhibin B. *International Journal of Cancer, 137*(7), 1661-1671.
2. Geerts, I., Vergote, I., Neven, P., & Billen, J. (2009). The Role of Inhibins B and Antimüllerian Hormone for Diagnosis and Follow-up of Granulosa Cell Tumors. *International Journal of Gynecological Cancer, 19*(5), 847-855.
3. Haltia, U., Hallamaa, M., Tapper, J., Hynninen, J., Alfthan, H., Kalra, B., Färkkilä, A. (2017). Roles of human epididymis protein 4, carbohydrate antigen 125, inhibin B and anti-Müllerian hormone in the differential diagnosis and follow-up of ovarian granulosa cell tumors. *Gynecologic Oncology, 144*(1), 83-89.
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5. Lappohn, R., Burger, H., Bouma, J., Bangah, M., Krans, M., & Bruijn, H. D. (1990). Inhibin as a marker for granulosa-cell tumors. *International Journal of Gynecology & Obstetrics, 31*(4), 384-385.

Oncofertility Saturday Academy Poster Abstract Form

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Abstract Categories

Check one only:

☐ **Reproductive Biology** ☐ **In Vitro Fertilization** ☒ **Cancer Biology** ☐ **Oncofertility**

☐ **Other** _____

ABSTRACT TITLE: The Effect of Embryonic Stem Cells on Ovarian Cancer

AUTHOR: Sonoma Gioscia

LEARNER OBJECTIVE: Please state the educational objective in a measurable, testable question. Then state what the participant's poster will be able to demonstrate to the viewer(s)/audience.

Question: In ovarian cancer, can embryonic stem cells be used as immunotherapy to halt the growth of tumors?

The participant will be able to demonstrate: The effect embryonic stem cells have on the immune system and its ability to stop the growth of tumors in ovarian cancer.

CONTENT (TOPICS): Please provide a brief statement or outline of the content/topic(s) to be presented:
Content will contain a brief explanation of ovarian cancer and the correlation between embryonic stem cells and the immune system. The effects embryonic stem cells have on ovarian cancer will also be discussed through research and data.

ABSTRACT: Abstract content should be single spaced, typed using (10-12 pt font) and between 250-300 words. The abstract content should be typed in the space below and **MUST** include the following:

The leading cause of death in gynecologic malignancy is ovarian cancer. Most women that are diagnosed with ovarian cancer are 55-64 years old and are in the III or IV stage due to the lack of recognizable symptoms and insufficient screening techniques. In 2016, over 70% of women were diagnosed in late stages of ovarian cancer and the average survival rate was less than 5 years. With research and time, scientists have compiled data that suggests human embryonic stem cells (hESCs) can effectively inhibit the growth of tumors in ovarian cancer via vaccination. Both case studies vaccinated rats and mice after giving them ovarian cancer that was derived from murine cells. In one case study, mice and rats were used. The mice were vaccinated with H9 cells (hESCs), IVP-ES1 (mouse ESCs), or phosphate-buffered saline (PBS) then inoculated with viable ID8 cells, mouse ovarian surface epithelium that resembles human epithelial ovarian cancer. The rats were vaccinated with H9 cells, NuTu-19 cells, or PBS then inoculated with viable NuTu-19 cells, rat ovarian cancer cell. A similar case study was done with just rats. Controlled studies were done to compare the data and results had shown tumor antigen expression of nm23, p53, C-myc, and HER-2 in both animals. In the H9 vaccinated rat models, tumor growth and metastasis were prolonged compared to the controlled groups (no duration of time was provided) and fewer amounts of tumors were found. Tumor antigens, markers, and genes are expressed in embryonic stem cells presenting a possible relationship between the two. These studies support the hypothesis that oncofetal antigens are expressed in cancer and embryonic cells, suggesting stem cell immunization might generate an immune response against gene products and tumor cells. This can further research and could be applied to women with pre-established ovarian cancer in clinical trials.

REFERENCES:

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Oncofertility Saturday Academy Poster Abstract Form

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Abstract Categories

Check one only:

☐ **Reproductive Biology** ☐ **In Vitro Fertilization** ☐ **Cancer Biology** ☒ **Oncofertility**

ABSTRACT TITLE: Viability of Autotransplantation of the Whole Ovary for Women at risk for Premature Ovarian Failure

AUTHOR: Leona Hariharan

LEARNER OBJECTIVE: Please state the educational objective in a measurable, testable question. Then state what the participant's poster will be able to demonstrate to the viewer(s)/audience.

Question: What is the efficacy of autotransplantation of the ovary in restoring endocrine function?

The participant will be able to demonstrate: This poster will determine the viability of autotransplantation of the whole ovary for women at risk for premature ovarian failure. It will also explain the benefits associated with this technique.

CONTENT (TOPICS): Please provide a brief statement or outline of the content/topic(s) to be presented: Autotransplantation of the ovary could potentially address the risk of premature ovarian failure associated with chemotherapy. The preservation technique can be used to restore endocrine and reproductive functions in females after cancer treatment.

ABSTRACT: Abstract content should be single spaced, typed using (10-12 pt font) and between 250-300 words. The abstract content should be typed in the space below and **MUST** include the following:

Standard Research Format

- Overview and Background
- Objective of Purpose (Research Focus or Question)
- Methods
- Results
- Conclusions
- List of references **(At least 5; not to be included in 250-300 word count.)**

Females undergoing cancer treatments or other gonadotoxic treatments have a variety of options when it comes to fertility preservation. This research will focus on a new preservation technique: ovarian autotransplantation. Specifically, this paper's objective is to explore the viability of autotransplantation of the whole ovary for women who are at risk for premature ovarian failure. In addition, this technique could prove beneficial because follicle atresia and ischemia are reduced, no ovarian stimulation is needed, and no delay in cancer treatment is necessary. Since ovaries have a great amount of plasticity, they can restore endocrine function after revascularization. Approximately 25% of all women diagnosed with cancer are of reproductive age. Furthermore, while chemotherapy has improved the survival rate, it has also increased the risk of developing premature ovarian failure. In fact, in one study, 50.6% of chemotherapy patients experienced permanent ovarian failure. If the ovaries were to be taken out before treatment and autotransplanted after treatment, this percentage could potentially go down. In terms of viability, autotransplantation of the whole ovary has not yet occurred in humans; there has, however, been success with similar methods. There have been reports of 26 successful births through autotransplantation of ovarian tissue. Subsequently, there has been success in animal studies with the procedure. In a foreign study, 4 out of 9 sheep regained luteal function and one of the four sheep was able to conceive spontaneously after the procedure. In addition, there has been a successful case in which a monozygotic twin donated her ovary to her sister who was eventually able to reproduce. These cases show that the viability and restorative potential of whole ovary autotransplantation.

REFERENCES:

1. Imhof, M., Bergmeister, H., Lipovac, M., Rudas, M., Hofstetter, G., & Huber, J. (2006). Orthotopic microvascular reanastomosis of whole cryopreserved ovine ovaries resulting in pregnancy and live birth. Fertility and Sterility, 85, 1208-1215.
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Abstract Categories

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☐ **Reproductive Biology** ☐ **In Vitro Fertilization** ☐ **Cancer Biology** ☒ **Oncofertility**

ABSTRACT TITLE: Restoring Fertility in Cancer Survivors with Biosynthetic Ovary Implants

AUTHOR: Stacy Hu

LEARNER OBJECTIVE: Please state the educational objective in a measurable, testable question. Then state what the participant's poster will be able to demonstrate to the viewer(s)/audience.

Question: Can 3-dimensional biosynthetic ovaries restore fertility in cancer survivors?

The participant will be able to demonstrate: The participant will demonstrate the viability of implanting 3D tissue scaffolds containing immature follicles into mice in effort of restoring endocrine and fertility function. It will focus on a recent study demonstrating the first successful 3D-printed biosynthetic ovary grafts in mouse models.

CONTENT (TOPICS): Please provide a brief statement or outline of the content/topic(s) to be presented:
Biosynthetic ovaries containing immature follicles must be 3D to ensure contact between the oocyte and its support cells, so the oocyte may develop successfully. In a recent study, 3D-printed gelatin scaffolds were examined *in vitro* and *in vivo*. The researchers observed ovulation of fully mature MII eggs and steroidogenesis *in vitro*. When the grafts were transplanted into ovariectomized mice for the *in vivo* study, they yielded live births through natural mating.

ABSTRACT: Abstract content should be single spaced, typed using (10-12 pt font) and between 250-300 words. The abstract content should be typed in the space below and **MUST** include the following:

Many female cancer patients undergoing gonadotoxic treatment can preserve their fertility with egg, embryo, or ovarian tissue cryopreservation.[1] However, ovarian tissue autotransplants are still experimental since hypoxia due to delayed revascularization depletes the number of viable follicles.[2] Additionally, egg and embryo freezing are not practical options for cancer patients in need of immediate treatment, since there is no time for ovarian stimulation cycles.[1] In 2017 alone, it is estimated that upwards of 7,000 women under the age of 45 will be diagnosed with metastatic cancers, for whom there are no effective fertility preservation options.[3] The goal of this study is to show that a 3D biosynthetic ovary can benefit these women by mimicking the structure and function of a natural ovary to restore fertility post-treatment. In a recent study, researchers 3D printed microporous bioprosthetic ovaries made of gelatin ink and seeded them with 40-50 immature murine follicles. The researchers observed ovulation of fully mature eggs and steroidogenesis *in vitro*. When the grafts were implanted into previously ovariectomized mice for *in vivo* study, orderly folliculogenesis was proven by the presence of primordial follicles; primary, secondary, and antral follicles; and corpora lutea. The researchers also examined the fertility of the mice with ovary implants through natural mating. 3 out of 7 mice with bioprosthetic ovaries yielded live births, while 0 of 2 mice with sham controls had pups. All pups from these matings were fed from their lactating mothers, demonstrating hormonal restoration. The porosity of the implant allowed for sufficient nutrient diffusion and revascularization.[4] Moving forward, further refining the pore geometry can optimize implant function, as another study on cardiac cell scaffolds has demonstrated.[5] Future research should also focus on gathering more data on murine models and extending these studies to larger animal models before moving on to human applications.

REFERENCES:

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2. Engelmayr, G. C., Jr., Cheng, M., Bettinger, C. J., Borenstein, J. T., Langer, R., & Freed, L. E. (2008). Accordion-Like Honeycombs for Tissue Engineering of Cardiac Anisotropy. *Nature Materials,7*(12), 1003-1010.

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Abstract Categories

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☐ **Reproductive Biology** ☐ **In Vitro Fertilization** x **Cancer Biology** ☐ **Oncofertility**

☐ **Other** _____

ABSTRACT TITLE: The Potential for Avian Newcastle Disease Virus (NDV) As An Alternative Immunotherapy Treatment for Solid Tumors

AUTHOR: Sathya Krishnasamy

LEARNER OBJECTIVE: Please state the educational objective in a measurable, testable question. Then state what the participant's poster will be able to demonstrate to the viewer(s)/audience.

Question: Can Avian Newcastle Disease Virus (NDV) be used as an alternative treatment for solid tumors to chemotherapy?

The participant will be able to demonstrate: It is the aim of this project to examine the practicality and potential for the Avian Newcastle Disease Virus (NDV) as an alternative, less harmful treatment to chemotherapy for solid tumors by exploring the proposed mechanisms of immune stimulation, degree of tumor regression induced, and cytotoxicity in the use of this oncolytic virotherapy.

CONTENT (TOPICS): Please provide a brief statement or outline of the content/topic(s) to be presented: The Avian Newcastle Disease Virus (NDV) has been shown to prefer human cancerous cells as a host due to a weakened immune response against the virus, which is an inherent factor that most solid tumors share. Selection of host cells by the virus is thought to be based in the overexpression of antiapoptotic or growth factors. NDV is able to cause tumor regression without an immune response and increase life expectancy for individuals with solid tumors.

ABSTRACT: Abstract content should be single spaced, typed using (10-12 pt font) and between 250-300 words. The abstract content should be typed in the space below and **MUST** include the following:

Standard Research Format

- Overview and Background
- Objective of Purpose (Research Focus or Question)
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ABSTRACT

One of the major challenges of chemotherapy is the chance of cancerous cells gaining drug resistance after a patient's initial exposure. Drug resistance may cause a relapse or neutralization of the treatment. Oncolytic virotherapy provides an alternative to chemotherapy that could be more effective in the treatment of solid tumors, especially for individuals with drug resistance. Furthermore, the use of Avian Newcastle Disease Virus (NDV) in the treatment of solid tumors could increase life expectancy for cancer patients. Recombinant forms of NDV from embryonated eggs or infected poultry can selectively bind to, enter, and use cancerous cells as hosts over normal cells. Research has largely used MTH-68, an intravenous form of NDV that is used for human stem cell lines and treatment of humans in clinical trials. Studies were conducted in human glioblastoma cells, non-small cell lung cancer, melanomas, and HeLa stem cell lines, as well as pc12 stem cell lines in rats using MTH-68 and P73. Studies show that NDV does not discriminate on the p53 gene, a tumor suppressor, and induces programmed cell death (apoptosis) in pc12 and HeLa cervical cells. NDV treatment has induced the regression of tumors by 50-90% both in vivo and in vitro and has increased life expectancy, dependent on the cancer and stage. The quantity and concentration of NDV also seems to play a significant role with the MOI for different cancers ranging from 1:1 to 100+:1. Bcl-xl, an antiapoptotic protein that aids tumor growth, initially was unresponsive to NDV, but after increasing the amount of the virus administered, apoptosis began to occur in correlation with the increased concentration of NDV. NDV treatments have been shown to be successful in increasing life expectancy when compared to chemotherapy, which suggests NDV may be a viable alternative treatment for cancer in the future.

REFERENCES

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4. Kazimirsky, G., Jiang, W., Slavin, S., Ziv-Av, A., & Brodie, C. (2016, October 10). Mesenchymal stem cells enhance the oncolytic effect of Newcastle disease virus in glioma cells and glioma stem cells via the secretion of TRAIL. Retrieved August 02, 2017, from https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5057491/
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Abstract Categories

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☒ **Reproductive Biology** ☐ **In Vitro Fertilization** ☐ **Cancer Biology** ☐ **Oncofertility**

☐ **Other** _____

ABSTRACT TITLE: Genetic Abnormalities Linked to Premature Ovarian Failure

AUTHOR: Katie Larratt

LEARNER OBJECTIVE: Please state the educational objective in a measurable, testable question. Then state what the participant's poster will be able to demonstrate to the viewer(s)/audience.

Question: Do genetic abnormalities play a role in the development of premature ovarian failure?

The participant will be able to demonstrate: This poster will demonstrate the essential role of the X chromosome, more specifically the role of the FMR1, BMP15, and PGMRC1 genes, in ovarian function and the development of premature ovarian failure. It will focus on clinical trials and research from several different countries using cohorts of women with different ethnicities, ages, and backgrounds.

CONTENT (TOPICS): Please provide a brief statement or outline of the content/topic(s) to be presented:
The prevalence of genetic anomalies is associated with premature ovarian failure among women throughout the world. It will include the standard cytogenetic analyses that were performed on these women to determine whether or not they had any genetic abnormalities. The studies will determine the approximate percentage of POF causes which are caused by genetics as well as expand on the need for more research in genetics.

ABSTRACT: Abstract content should be single spaced, typed using (10-12 pt font) and between 250-300 words. The abstract content should be typed in the space below and **MUST** include the following:

Standard Research Format

- Overview and Background
- Objective of Purpose (Research Focus or Question)
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- List of references **(At least 5; not to be included in 250-300 word count.)**

Premature ovarian failure (POF) is a condition which causes the cessation of ovarian function and the onset of menopause before age 40. POF can develop as early as the teen years, causing amenorrhea, sterility, and menopausal symptoms, such as urogenital syndrome and osteoporosis. The chance of becoming pregnant with POF is around 5%. In fact, this disease leads to 10% of ovulatory female sterility. POF is already known to be caused by several factors, including autoimmune diseases, metabolic diseases, or cancer treatment; however, about 10-15% of women with POF have an affected first-degree relative, giving rise to the idea that the disease can also be caused by genetic abnormalities. Among these abnormalities, mutations in the X chromosome appear to play a key role in the development of POF. Karyotype, fluorescent in situ hybridization (FISH) analysis, and FMR1 testing was performed on several cohorts of women with POF to detect chromosomal abnormalities. Structural and numerical X chromosomal anomalies appeared in the results, and it was found that around 20% of POF cases are caused by genetic mutations. The most common mutations occur in the FMR1, BMP15, and PGRMC1 genes in the form of numerical defects, deletions, and translocations. Sex chromosome mosaicism also presents itself in about 20% of women with POF, although its impact on ovarian function and infertility is unknown. These studies highlight the importance of the X chromosome in POF etiology and show that the routine assessment of chromosomal anomalies is highly important as it provides information for reproductive management and genetic counseling. It has been established that the X chromosome and these three genes play a role in the development of POF, but further genetic screening and analysis is necessary for the understanding of the role that these three genes play in ovarian health.

REFERENCES:

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Abstract Categories

Check one only:

☐ **Reproductive Biology** ☐ **In Vitro Fertilization** ☐ **Cancer Biology** ☐ **Oncofertility**
☒ **Other _____Bioethics_____**

ABSTRACT TITLE: The Correlation between the Effects of Cultural and Socioeconomic Factors and a Higher Risk of Triple Negative Breast Cancer in African American Women

AUTHOR: Olivia Lewis

LEARNER OBJECTIVE: Please state the educational objective in a measurable, testable question. Then state what the participant's poster will be able to demonstrate to the viewer(s)/audience.

Question: What effect does socioeconomic and cultural factors have on Triple Negative Breast Cancer survival rates in the African American community?

The participant will be able to demonstrate: This poster will discuss the cultural and socioeconomic aspects within the African American community that cause a disadvantage in survivorship with aggressive diseases such as Triple Negative Breast Cancer.

CONTENT (TOPICS): Please provide a brief statement or outline of the content/topic(s) to be presented:
The African American community faces unique obstacles that decrease the survival rate of aggressive diseases such as Triple Negative Breast Cancer. Cultural factors such as not breastfeeding and socioeconomic factors such as lacking adequate health care, impede African American women from taking preventative measures against aggressive breast cancers.

ABSTRACT: Abstract content should be single spaced, typed using (10-12 pt font) and between 250-300 words. The abstract content should be typed in the space below and **MUST** include the following:
Standard Research Format

- Overview and Background
- Objective of Purpose (Research Focus or Question)
- Methods
- Results
- Conclusions
- List of references **(At least 5; not to be included in 250-300 word count.)**

Breast Cancer is a disease that enters the lives of women of all races and ethnicities. However, Triple Negative Breast Cancer (TNBC) is an aggressive subtype that is prevalent among premenopausal African American (AA) women.[2] Reasons for this include socioeconomic and cultural factors such as lack of breastfeeding, distrust towards non-black physicians, lack of a doctor/patient relationship, lack of *adequate* healthcare, and a lack of participation in clinical trials. Most of these factors have not been fully explored. However, reproductive factors such as lactation and parity have been assessed. AA women have been found to have more children and breastfeed less than other ethnicities.[3] A study done by the AMBER Consortium tested this by analyzing the reproductive factors of 5,087 AA women who were diagnosed with invasive breast cancer. Each participant was classified as ER+, PR+, or triple negative (ER-, PR-, HER2-). Data regarding the participant's age at diagnosis, number of births, lactation, and age at first birth were collected and compared with each breast cancer subtype. The results revealed that parous women have an increased risk of ER- and TNBC, and that breastfeeding can reduce these risks. Choosing to not breastfeed can increase risk of breast cancer among all women. However, this is mainly an issue in the African American community due to cultural aspects along with a lack of education on the matter. In this case, a connection between reproductive factors and TNBC could be found among AA women. However, cultural and socioeconomic factors such as distrust in and lack of adequate healthcare have yet to be investigated. More research that specifically targets and aims to aid and educate the AA community about the damaging effects of these factors is necessary.

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Oncofertility Saturday Academy Poster Abstract Form

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Abstract Categories

Check one only:

☐ **Reproductive Biology** ☐ **In Vitro Fertilization** ☒ **Cancer Biology** ☐ **Oncofertility**

☐ **Other: _____**

ABSTRACT TITLE: The Correlation Between Infertility Treatments and Post-Reproductive Breast Cancer

AUTHOR: Emily Potts

LEARNER OBJECTIVE: Please state the educational objective in a measurable, testable question. Then state what the participant's poster will be able to demonstrate to the viewer(s)/audience.

Question: Is there a correlation between infertility treatments, specifically clomiphene citrate (CC) and follicle stimulating hormone (FSH), and an increased risk of developing breast cancer, post reproduction?

The participant will be able to demonstrate: The poster will provide evidence for the hypothesis that women who use fertility drugs have an increased risk of getting post-reproductive, young-onset breast cancer.

CONTENT (TOPICS): Please provide a brief statement or outline of the content/topic(s) to be presented:
As technology improves, many women who are having trouble getting pregnant are choosing to do assisted reproduction. This poster will focus on how the aid of fertility drugs promotes post-reproductive, young-onset breast cancer in patients under the age of 50.

ABSTRACT: Abstract content should be single spaced, typed using (10-12 pt font) and between 250-300 words. The abstract content should be typed in the space below and **MUST** include the following:

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Fertility drugs, clomiphene citrate (CC) and follicle stimulating hormone (FSH), are taken during controlled ovarian stimulation (COS) stage of in-vitro fertilization (IVF) to mimic the natural rise of progesterone and estrogen. The objective is to find the correlation between younger women undergoing fertility treatments and the increased risk of breast cancer post-treatment. In a cross-sectional study done with a little over 43,000 women (1,576 went through COS, 1,429 had hormonal stimulation without COS and 5,958 didn't receive any hormonal fertility treatment), researchers found that women with a history of infertility and had COS had a higher absolute dense and non-dense volume, possibly due to the effect of estrogen promoting excessive growth of breast tissue: fibroglandular tissue in the breast is the target for tumor development. Due to both the nature of the tissue and increased difficulty to screen, women with dense breasts have a 4-6x higher risk of breast cancer. In a study with 1,422 women (case and control), younger than 50 years old, who had a sister diagnosed with breast cancer, evaluations were done to see if treatment had induced a pregnancy that lasted 10+ weeks. Out of 288 final participants, 193 took CC only, 29 took FSH only, and 66 took both. Though overall data suggests there wasn't a significant increased risk, women who used the fertility drugs and conceived were at a higher risk of getting young-onset breast cancer. In yet another study, a long-term risk after use of progesterone and nulliparous women exposed to gonadotropins was found. There are inconsistent findings in the case studies conducted due to various limitations, for example, the number of cases observed and the length of follow up. Future research should address these limitations while focusing on each drug and combination.

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1. Fei, C., DeRoo, L. A., Sandler, D. P., & Weinberg, C. R. (2012, July 03). Fertility drugs and young-onset breast cancer: results from the two sister study | *JNCI: Journal of the National Cancer Institute | Oxford Academic*. https://academic.oup.com/jnci/article/104/13/1021/2516873/Fertility-Drugs-and-Young-Onset-Breast-Cancer
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Oncofertility Saturday Academy Poster Abstract Form

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Abstract Categories

Check one only:

☐ **Reproductive Biology** ☐ **In Vitro Fertilization** ☐ **Cancer Biology** ☐ **Oncofertility**

☐ **Other** _____

ABSTRACT TITLE: The Use of mTOR to Control T Regulatory Cells During Fetal Development

AUTHOR: Smayra Ramesh

LEARNER OBJECTIVE: Please state the educational objective in a measurable, testable question. Then state what the participant's poster will be able to demonstrate to the viewer(s)/audience.

QUESTION: How can mTOR be used to influence Treg cells to combat pregnancy complications?

The participant will be able to demonstrate: This poster will evaluate how Treg cell concentrations correlate to early pregnancy complications. It will also focus on how the modulation of Treg cells can be used as a new target for infertility treatments.

CONTENT (TOPICS): Please provide a brief statement or outline of the content/topic(s) to be presented:
T regulatory (Treg) cells are a very recent discovery of a subset of T-lymphocytes. They have been studied to have extremely potent suppressive activity and important roles in controlling the immune responses of the body. Looking more specifically at regulating these Treg cells, scientists have suggested that mTor signaling be used since it has been known to impact Treg homeostasis, activation, and differentiation.

ABSTRACT: Abstract content should be single spaced, typed using (10-12 pt font) and between 250-300 words. The abstract content should be typed in the space below and **MUST** include the following:

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In recent years, there has been a great deal of investigation and progress in immunology as researchers explore its effectiveness in solving certain unexplained fertility issues within the female reproductive system. Currently, many scientists have turned to the T- regulatory (Treg) cell to solve complications in the early stages of pregnancy. It has been studied that the inhibition of the mTor pathway can improve fertility in women who face pregnancy complications due to a lack of T regulatory cells. Studies show that through mTor signaling, the Treg cells can be controlled to regulate immune responses directly at the fetal or maternal interface either by interacting with other cells or by inducing the expression of T cells. One study discovered that the number of Treg cells decrease in cases of miscarriage and was tested to prove the number of Treg cells decreased significantly in a mouse abortion model, suggesting that decreased Treg cells strongly link to miscarriages. Furthermore, patients who develop preeclampsia were 25-35% more likely to exhibit decreased T regulatory cell counts. In patients with fertility problems due to low treg cell counts, a potential cause could be the over expression of mTOR proteins. This is often caused by over activation of kinase receptors within the cell, specifically, AKT and P13K. AKT acts by promoting transcriptor proteins within the mTORC1 complex while P1K3 is heavily involved in promoting transcription proteins within the mTORC2 complex. Second generation mTOR inhibitors have been shown to effectively inhibit the AKT and P1K3 pathways in clinical trials. By targeting both kinases at the same time, it effectively inhibits the mTOR pathway. And in response, an upregulation of T regulatory cells is likely to occur. Investigating the inhibitors for this pathway can help solve some of the issues such as unexplained infertility, miscarriage and preeclampsia that are linked with numerical and functional deficiency of T regulatory cells.

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Oncofertility Saturday Academy Poster Abstract Form

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Abstract Categories

Check one only:

X Reproductive Biology ☐ **In Vitro Fertilization** ☐ **Cancer Biology** **Oncofertility**

ABSTRACT TITLE: Increased correlation between ethnicity and Polycystic Ovarian Syndrome

AUTHOR: Sofia Reyes

LEARNER OBJECTIVE: Please state the educational objective in a measurable, testable question. Then state what the participant's poster will be able to demonstrate to the viewer(s)/audience.

Question: Is there a relationship between a patient's ethnicity and phenotype causing increased potential of PCOS diagnosis and variability its criteria?

The participant will be able to demonstrate: The poster will help show if some ethnicities have a higher rate of PCOS diagnosis and how much of a link there is between ethnicity and variation in the metabolic phenotype of PCOS and how might this link cause different symptoms to be more prevalent in certain ethnicities.

CONTENT (TOPICS): Please provide a brief statement or outline of the content/topic(s) to be presented: The poster will discuss a potential link between ethnicity and phenotype that causes a higher risk of PCOS amongst certain ethnic women, along with a resulting variation in the co-morbidities and symptoms. This will be done by comparing case studies where different ethnic women with PCOS were studied. It is important for physicians to take into consideration the interrelation found between PCOS and ethnicity to allow for effective treatment, and address common uncertainties such as the difficulty to define ethnicity, the large spectrum of PCOS and whether or not the Rotterdam criterion is an effective classification means across the board.

ABSTRACT: Abstract content should be single spaced, typed using (10-12 pt font) and between 250-300 words. The abstract content should be typed in the space below and **MUST** include the following:

Polycystic Ovarian Syndrome (PCOS) is the most common endocrine problem causing infertility for women of reproductive age. Symptoms of PCOS include: hyperandrogenism, insulin resistance, chronic anovulation, irregular hair growth and in some cases a polycystic ovary. Increasingly, women of differentiating ethnicity have contracted PCOS in different rates and factors. The need for further research on the correlation and regarding PCOS is important as PCOS holds high prevalence of metabolic syndrome, diabetes and cardiovascular disease. The objective of this poster is to first prove through case studies that there is a correlation between ethnicity and PCOS, why this predisposition exists and what it might mean for the patient and their treatment. This will also address how large of a factor a patient's lifestyle, outside of medical practice, affects their health; including their environment and ethnicity. It is increasingly recognized that different ethnic backgrounds are likely contributors to different manifestos of PCOS and PCOS phenotypes. One such study explored the possibility of an Asian phenotype, where women from East Asia have been reported to have a lower BMI and a milder hyper androgenic phenotype, but with the highest prevalence of metabolic syndrome. Another study showed that South Asian women have a high prevalence of insulin resistance and metabolic syndrome, and are at a larger risk of type 2 diabetes. Various studies amongst certain ethnicities have been conducted demonstrating a degree of correlation amongst PCOS and ethnicity, but there is a need for studies to connect results and conclude if there are ethnic variations in the prevalence of PCOS and its clinical representation. Understanding the prevalence of ethnicity in PCOS women is important to help target the relevant populations to establish the most effective treatment that meets the patients' needs.

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Oncofertility Saturday Academy Poster Abstract Form

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Abstract Categories

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☒ **Reproductive Biology** ☐ **In Vitro Fertilization** ☐ **Cancer Biology** ☐ **Oncofertility**

☐ **Other** _____

ABSTRACT TITLE: A Case of Emasculation of Fish and Humans through Endocrine Disruption

AUTHOR: Hanna Taglinao

LEARNER OBJECTIVE: Please state the educational objective in a measurable, testable question. Then state what the participant's poster will be able to demonstrate to the viewer(s)/audience.

Question: Does endocrine disruption influence the fertility of male humans and fish?

The participant will be able to demonstrate: How synthetic hormones contributes to the the decline in human male fertility and fish reproduction. Due to endocrine disruptors, male humans and fish experience fertility complications and changes in their reproductive biology.

CONTENT (TOPICS): Please provide a brief statement or outline of the content/topic(s) to be presented: Synthetic estrogen, 17ß-estradiol (E2) and 17α-ethynylestradiol (EE2), Endocrine Disruption, RNA-seq, gulf pipe fish, reproductive performance, testicular Cancer, Male Infertility, Testicular dysgenic syndrome, sperm quality, cryptorchidism, Brazil, negative sperm quality

ABSTRACT: Abstract content should be single spaced, typed using (10-12 pt font) and between 250-300 words. The abstract content should be typed in the space below and MUST include the following:

The importance of this research is to identify if endocrine disruptors such as, 17ß-estradiol (E2) and 17α-ethynylestradiol (EE2), are the cause of Gulf Pipe Fish to be transgendered and Brazilian men to be infertile. This work attempts to address the problems of endocrine disruption and its negative effect on male fertility to raise awareness of the environmental cause of infertility on humans, that is clearly seen in fish. Epidemiological studies have been started to analyze the short and long-term effects of endocrine disruptors on human males. Results of the epidemiological studies dealing with observed time trends in Brazilian male fertility disorders show a deterioration of sperm quality, a rise in testicular cancer, and an increase in cryptorchidism. Data is collected from a comparison of sperm count, motility, and morphology of 2300 semen samples from 2000 to 2002 and 2010 to 2012. In Ceara, Brazil, Data was collected by water samples analyzing and identifying four estrogenic hormones in five biological wastewater treatment plants, resulting E2 and EE2 both with a 52% occurrence. Data shows the average sperm concentration/ml decreased significantly from 61.7 million in 2000-2002 to 26.7 million and in 2010-2012, the total sperm concentration decreased significantly from 183.0 million to 82.8 million. With the results, there is a link between the decrease in human and fish male fertility that derives from the E2 and EE2, endocrine disruptors occurrences in water ways. This environmental problem needs to be further investigated to address endocrine disruption and its negative impact on fish and human males fertility, before more critical problems arise such as extinction and birth defects.

REFERENCES:

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Oncofertility Saturday Academy Poster Abstract Form

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Abstract Categories

Check one only:

☒ **Reproductive Biology** ☐ **In Vitro Fertilization** ☐ **Cancer Biology** ☐ **Oncofertility**

☐ **Other** _____

ABSTRACT TITLE: The Frequency and Types of Y Chromosome Microdeletions Among Infertile Men with Azoospermia or Severe Oligozoospermia

AUTHOR: AnnMarie Walker

LEARNER OBJECTIVE: Please state the educational objective in a measurable, testable question. Then state what the participant's poster will be able to demonstrate to the viewer(s)/audience.

Question: What is the frequency and what are the types of Y chromosome microdeletions among infertile men with azoospermia or severe oligozoospermia and what are the implications in the male infertility work-up?

The participant will be able to demonstrate: The poster will demonstrate the frequency and types of Y chromosome microdeletions among infertile men with azoospermia or severe oligozoospermia through genetic studies done on men of different ethnicities and locations across the globe. The application to male infertility screening will also be discussed.

CONTENT (TOPICS): Please provide a brief statement or outline of the content/topic(s) to be presented:
Y chromosome microdeletions in men with azoospermia or severe oligozoospermia leads to infertility. Azoospermia is the complete absence of sperm from the fluid ejaculated during orgasm. Oligozoospermia is low sperm concentration in ejaculate. Because of their azoospermia or oligozoospermia, they are infertile.

ABSTRACT: Abstract content should be single spaced, typed using (10-12 pt font) and between 250-300 words. The abstract content should be typed in the space below and **MUST** include the following:
The frequency and types of Y chromosome microdeletions among infertile men with azoospermia and severe oligozoospermia and the implications of this in the male infertility work-up will be demonstrated. The frequency and types of Y chromosome microdeletions can be influenced by geographical location. One study showed that Y chromosome deletions were detected in about 12.1% of Iranian infertile men. Another study took 1885 Iranian infertile men with azoospermia or severe oligozoospermia and tested them for microdeletions. Only 5.2% were diagnosed with microdeletions in the azoospermia factor. It is suspected the differences are due to ethnicity and the composition of the sample size and study populations. A study done on 3731 Chinese infertile men showed 9.14% had microdeletions in the AZF region. Another study done on 71 Indonesian men showed 15.49% had an AZFa microdeletion. Most of AZF microdeletions were found in the AZFa region for Indonesian men, whereas this was lower in Iranian men. Different frequencies and types of microdeletions can be explained by the differences in ethnicity. The genetics of each race or ethnicity can cause microdeletions in different AZF regions. Currently, microdeletion screening is not a part of the male infertility work-up. Screening should be advised for infertile men before using assisted reproduction treatments. Microdeletion screening should be a part of the male infertility work up.

REFERENCES:

1. Yousefi-Razin, E., Nasiri, M. J., & Omrani, M. D. (2016). Frequency of Y Chromosome Microdeletions Among Iranian Infertile Men with Azoospermia and Severe Oligozoospermia: A Meta-analysis. *Journal of Reproduction & Infertility*, *17*(4), 208–212.
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Oncofertility Saturday Academy Poster Abstract Form

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Abstract Categories

Check one only:

☐ **Reproductive Biology** ✓ **In Vitro Fertilization** ☐ **Cancer Biology** ☐ **Oncofertility**

ABSTRACT TITLE:
The Potential Utilization of CRISPR During the IVF Process In Order to Target the BRCA1 Gene

AUTHOR:
Kylie Williams

LEARNER OBJECTIVE: Please state the educational objective in a measurable, testable question. Then state what the participant's poster will be able to demonstrate to the viewer(s)/audience.

Question: Can cancer genes and/or mutations be extracted from an embryo during the process of in vitro fertilization? If so, how? What ethical issues does this trigger?

The participant will be able to demonstrate: This study will demonstrate the possible use of the gene editing tool, CRISPR-Cas9, to extract and replace inherited BRCA1 genes discovered during the process of in vitro fertilization.

CONTENT (TOPICS): Please provide a brief statement or outline of the content/topic(s) to be presented: The topic includes the scientific potential of gene editing tools, specifically CRISPR-Cas9. It will also cover the current ethical debate concerning CRISPR Cas-9, its use in humans, and hereditary cancer genes such as BRCA1 that can be identified in an embryo.

ABSTRACT: Abstract content should be single spaced, typed using (10-12 pt font) and between 250-300 words. The abstract content should be typed in the space below and **MUST** include the following:

About 1 in every 500 people in the United States carries either the BRCA1 or BRCA2 gene. That totals to roughly 538,500 people in the US alone possessing this potential breast cancer trait. Potential offspring of these carriers have a 50% chance of acquiring BRCA1/2 gene mutations as well, and once the mutation becomes penetrative, have an 85% chance of actually developing breast cancer. This research poses a solution concerning the BRCA1 gene specifically - and conceiving through in vitro fertilization. An inherited BRCA1 gene can be detected as early as the embryonic stage. According to this research, once one or more viable embryos that contain an inherited BRCA1 gene mutation are produced through IVF, scientists will be able to use a world-renowned gene editing tool, entitled CRISPR, along with the Cas9 enzyme, in order to locate the BRCA1 gene, cut at a desired location in the DNA sequence, and remove the gene, to be later replaced with healthy programmed DNA. CRISPR-Cas9 utilizes guide RNAs that correspond to DNA targets in order to edit at a high efficiency. This leads researchers to believe that CRISPR is now capable of more advanced genome targeting in medicine and biotechnology. CRISPR has only recently been used on human embryos, and the outcome was reasonably successful - yet ethical bans and restrictions on its use across major, prominent countries have prohibited those embryos from being used for reproductive purposes. Although the concept is one of the near future - especially regarding ongoing ethical debates concerning experimental editing of human embryos - CRISPR-Cas9 could potentially be used to remove and replace an inherited BRCA1 cancer gene from a human embryo during the process of in vitro fertilization in order to decrease the statistic of developed breast cancer among males and females.

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