Sociedad de Biología de Cuyo

XXXVII Reunión Científica Anual

5 y 6 dic 2019 - San Luis

Libro de Resúmenes

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Sociedad de Biología de Cuyo

5 y 6 de Diciembre de 2019

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Argentina

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Departamento de Asistencia Médico Social Universitario (DAMSU)

Sociedad Argentina de Genética (SAG)

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CONFERENCIAS Y SIMPOSIOS

Conferencia Inaugural

BIOETHICAL CHALLENGES AGAINST TECHNOLOGICAL ADVANCES IN REPRODUCTIVE BIOLOGY

Laconi, Myriam R.
Laboratorio de Fisiopatología Ovárica. IMBECU-CONICET- Mendoza. mlaconi@mendoza-conicet.gob.ar

Bioethics is a space for study and reflection in the construction of positions based on unstoppable scientific and technological advances. Thanks to the advances of science, solutions have been discovered for numerous problems of humanity with clear positive consequences, but also, there have been situations with undoubted bioethical objections. Given these challenges and dilemmas, bioethics analyzes the cost and benefit of each advance. The question arises, "Is everything that is technically possible ethically acceptable?" The bioethics debate about the human right to decide about your body, sexuality, reproductive rights, how to face the disease, aging and the right to die with dignity. It provides tools and builds a regulatory framework on which laws can be generated to achieve general welfare within the framework of freedom. Reproductive biology exhibe numerous bioethical challenges such as assisted fertilization, gamete manipulation and genetic editing. The genetic edition of human embryos using the CRISP Cas9 technique has caused a scientific revolution. CRISPR CAS 9 means short, palindromic, grouped and regularly interspaced repetitions. The genetic edition of human embryos raises the possibility of avoiding diseases of genetic transmission, improves xenotransplants, improve the quality of milk and meat but also, the possibility of changing the genome and choosing traitsspecail features is very risky. Many scientists fear eugenics (good origin) or the application of the biological laws of inheritance to the perfection of the human species. So, ¿are all possible applications of CRISP Cas 9 known today? What are the limits? There is still much to define, for example, the ecological risk of altering natural evolution and use in biological terrorism. An impasse is required to reflect on the consequences and where we want to go as a species.

Conferencia:

SEXUALLY-TRANSMITTED INFECTIONS: WHAT´S NEW ABOUT THE CONTROL OF *CHLAMYDIA TRACHOMATIS*

Damiani MT
Laboratory of Biochemistry and Immunity. Institute of Biochemistry and Biotechnology. Faculty of Medicine. National University of Cuyo. Institute of Medicine and Experimental Biology of Cuyo (IMBECU). CONICET.UNCuyo. meteresadamiani@gmail.com

Chlamydia trachomatis (Ctr) is the most common bacterial cause of sexually transmitted infections (STIs). The World Health Organization (WHO) estimates that 131 million are infected each year, mainly young people of reproductive age. In women, Ctr causes cervicitis, endometritis, salpingitis, which frequently persists along time leading to serious complications such as pelvic inflammatory disease, spontaneous abortions and tubal infertility. Newborns, when infected in the birth canal, can develop conjunctivitis and pneumonia; whereas men can suffer urethritis, prostatitis, and epididymitis. Ctr is the main cause of preventable blindness or trachoma worldwide. There was an epidemiological alert in Argentina in August 2018 for the appearance of venereal lymphogranuloma. The asymptomatic nature of most of the infections makes diagnosis and treatment difficult. Besides, the lack of a preventive vaccine and the antibiotic resistance increase reveal the need for new tools for the prevention and control of chlamydial infections. Ctr invades cervical epithelial cells through numerous receptors, many of them glycosylated, and survives and multiplies intracellularly in a vesicle called inclusion. We have shown the release of a glycan-binding protein, galectin 1 (Gal1), in cervical tissues under inflammation. This lectin engages glycosylated bacterial proteins, like MOMP (Major Outer Membrane Protein) and OmcB, to glycosylated cervical epithelial cell receptors such as PDGFR and various integrins. Acting as a bridge between bacterial and eukaryotic glycans, Gal1 promotes invasion, increasing not only the number of infected cells but also the number of inclusions per cell and the number of bacteria per inclusion. Lactose, glycanases or neutralizing antibodies against glycosylated receptors decrease the magnitude of chlamydial infections. In agreement, mice KO for complex N-glycan-forming enzymes and Gal1 are less susceptible to infection. These findings suggest that hijacking bacterial glycan-Gal1-glycosylated receptors bridge could be a new tool to prevent cell invasion and overall Ctr infection. Once inside the cell, Ctr avoids its degradation in the phagocytic pathway by hijacking Rab proteins, the main controllers of intracellular transport. By bacterial-driven mechanisms, certain Rabs are recruited to the chlamydial inclusion while others are excluded. We have described that Ctr intercepts Rab14-mediated transport not only to evade fusion with lysosomes but also to acquire sphingolipids synthesized at the Golgi apparatus. Molecular mechanisms underlying how these bacteria manipulate intracellular transport are a matter of intense study. We demonstrate that Ctr provokes Akt phosphorylation along its entire developmental life cycle and recruits phosphorylated Akt (pAkt) to the inclusion membrane. As a consequence, Akt Substrate of 160 kDa (AS160), also known as TBC1D4, a GTPase Activating Protein (GAP) for Rab14, is phosphorylated and therefore inactivated. Phosphorylated AS160 (pAS160) loses its ability to promote GTP hydrolysis, favoring Rab14 binding to GTP. Akt inhibition by an allosteric isoform-specific Akt inhibitor (iAkt) prevents AS160 phosphorylation and reduces Rab14 recruitment to chlamydial inclusions. iAkt further impairs sphingolipids acquisition by Ctr-inclusion and provokes lipid retention at the Golgi apparatus. Consequently, treatment with iAkt decreases chlamydial inclusion size, bacterial multiplication, and infectivity in a dose-dependent manner. Similar results were found in AS160-depleted cells. By electron