

A history of the Organization for the Study of Sex Differences (OSSD)

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The Organization for the Study of Sex Differences (OSSD) was founded in 2006 as an international society composed of member scientists and clinicians, dedicated to interdisciplinary research and education to increase understanding of sex and gender differences in health and disease. The goals of the OSSD are described on the OSSD website (www.ossdweb.org).

The annual meeting of the OSSD was first held in 2007 in Washington D.C. The meeting has numerous goals: 1) to discuss recent advances in basic and clinical research; 2) to build interdisciplinary networks among member scientists; 3) to discuss educational programs and approaches to study sex and gender in health and disease; and 4) to discuss policy issues of public funding agencies such as the US National Institutes of Health (NIH), Canadian Institute of Health Research (CIHR) and US Food and Drug Administration (FDA). The meeting explicitly fosters career development of early-stage scientists, including numerous opportunities to present research, workshops/mentoring sessions, and awards for trainee research. The meeting is purposefully inclusive of persons of all genders, sexual orientation, racial/ethnic and cultural backgrounds, and career stages, reflecting a commitment to understanding variation among and within sexes and genders across the lifespan. In addition to the annual meetings, the yearly OSSD calendar includes online lectures and other activities.

The founding of the OSSD was a joint effort of research scientists and the staff of the Society for Women's Health Research (SWHR; www.swhr.org). The SWHR is a US-based advocacy organization, a thought leader in promoting research in biological sex differences in disease and improving women's health through science, policy, and education efforts. SWHR's activities include advocating policies within the research agendas of the NIH and FDA, fostering scientific exchange, disseminating information, and enhancing scientific attitudes to improve the design and conduct of research related to women's health.

Numerous scientific and cultural forces led to the founding of the SWHR and OSSD. By the 1990s, scientists at the NIH, led by Dr Florence Haseltine and others, were concerned that the NIH was not dealing effectively with many health issues affecting women. Although

sex differences were clearly recognized in reproduction and the reproductive tract tissues, sex differences in other organ systems were often ignored or understudied. Dr Haseltine and others founded the SWHR to advocate for changes in attitudes and policies. Partly because of SWHR's advocacy, in 2001 the US Institute of Medicine commissioned and published *Exploring the biological contributions to human health: does sex matter?*.¹ This report documented many examples of significant sex differences in health and disease and recommended increased study of the impact of sex at all levels of biological functions, from single cells to whole body organ systems and behavior.

From 2000-2006, the SWHR sponsored a series of annual scientific conferences entitled "Sex and Gene Expression" (SAGE), discussing basic biological sex differences. SWHR also established several small committees (called ISIS networks, Interdisciplinary Studies in Sex Differences) within specific disciplines. The authors of the present article were members of the first such network on "Sex, Gender, Drugs, and the Brain", beginning in 2002. This network published an impactful article on best practices concepts for studying sex differences in brain and behavior², which was also relevant to other fields. Members of this network and another ISIS network published a book on sex differences.³

When the ISIS brain network finished its meetings, some of its members joined with scientists from other disciplines, working with staff of the SWHR, to found the OSSD (<https://www.ossdweb.org/founders>). Organizers were inspired by a general lack of information about biological processes during health and disease in females, because most clinical and basic science studies focused on males or did not report the sex of cells or subjects.⁴ Based on growing evidence for significant sex differences at every level of biomedical inquiry, the founders also sought to combat the misimpression among many biomedical scientists that sex differences were minor, as evidenced by the failure to consider or report the sex of subjects in many preclinical studies. The annual meetings were initially patterned after the SAGE meetings.

In the early years of the OSSD, the SWHR provided administrative and financial support to the OSSD. By

2012, the OSSD became an independent non-profit corporation, supported by membership dues and meeting fees of members, and NIH and FDA grants, and led entirely by democratically elected officers. The office of the President is organized as group of three people, the Past-President, current President, and President-Elect. This helps to distribute decisions and provide for a six-year continuity of leadership that progressively self-renews. The other elected leaders are the Treasurer and Secretary. An elected group of about 15 Councilors gives advice and has specific responsibilities under the auspices of the Bylaws. An Executive Secretary provides business and organizational support. Other OSSD members serve on committees to contribute to OSSD activities. The OSSD is governed by Bylaws available on the OSSD website and is legally established as a US non-profit corporation.

In 2012, the OSSD and SWHR established the OSSD's official journal, *Biology of Sex Differences*, published by Springer-Nature (2023 impact factor 7.9). The Editor-in-Chief of the *Biology of Sex Differences* is currently proposed by the OSSD with approval of the SWHR and publisher.

OSSD attracts a strong base of members interested in women's health research, but the conceptual framework is broader. The society is concerned with variations caused by sex and gender variables, with the understanding that studying sex differences will incur benefits to everyone, regardless of sex or gender. Importantly, obtaining data on females and males is not enough. Rather, an underlying tenet is that comparison of different sexes gives deeper appreciation of health and disease.⁵ For example, if one sex is protected from disease more than another, understanding the cellular and molecular pathways causing the sex difference may uncover sex-specific protective factors that could be targeted clinically to alleviate disease in all groups. Understanding sexual variation in physiology is therefore essential for better understanding of human disease.

The 17th annual meeting of the OSSD in 2023, in Calgary, Alberta, Canada was attended by over 300 people including a record number of trainees. The meeting comprised 20 sessions including symposia, workshops,

plenary lectures and poster sessions with numerous networking and educational events for trainees and investigators. Over 70 awards were given to trainees. Each symposium optimally included both basic and clinical research, over a wide range of scientific topics. Meeting attendees enjoyed the opportunity to meet investigators in a wide array of disciplines, with the common theme of the importance of examining sex differences. The 2024 OSSD annual meeting will be held in Bergen, Norway May 6-9, 2024, the first OSSD meeting to be held outside of North America.

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Conflicts of interest statement. Arthur P. Arnold was a member of the OSSD Nominations Committee 2023 and Founding Editor-in-Chief of the journal *Biology of Sex Differences*; Jill B. Becker is Councilor of the OSSD and Editor-in-Chief of the journal *Biology of Sex Differences*.

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