Impressions from Sleep and Circadian Researchers at the inaugural Advances in Sleep and Circadian Science meeting.

The first Advances in Sleep and Circadian Science (ASCS) meeting took place at the Sheraton Sand Key Resort, in Clearwater Beach, Florida from February 1st-4th, 2019. The meeting was developed and sponsored by the Sleep Research Society (SRS) to highlight and catalyze integrative sleep and circadian science. A program committee of eighteen members of the SRS and the Society for Research on Biological Rhythms, including faculty and trainees, planned the meeting. Over three days and eight sessions, the speakers and discussants skillfully weaved together the parallel threads of sleep and circadian rhythms research by not only presenting their own data but presenting their views on the avenues of concordance between the two fields in their own research outlook. It was a single session conference, all attendees were housed at the Sheraton and all meals were provided which allowed for a more intimate setting, better discussion, and lots of networking opportunities. The trainees were central to the meeting which included two data blitz/poster sessions, two formal roundtable lunches to discuss challenges in science, and 30 merit-based travel awards. Three plenary sessions included a lecture from Dr. Michael Rosbash, 2017 Nobel Laureate and TED style talks by Drs. Chiara Cirelli, Charles Czeisler, Joe Takahashi, and Dan Buysse, discussing the Future of Transdisciplinary Sleep and Circadian Science. The meeting was attended by 174 sleep and circadian scientists from around the world.

Impressions from a Sleep Scientist - Heinrich Gompf
University of Massachusetts Medical School, Worcester, MA, USA

As a sleep scientist, there were a number of research highlights that stood out, tying together the sleep circuitry and circadian fields. A number of insights presented have clearly shown how we as a community are getting a good handle on the mammalian circuitry underlying circadian inputs, light-induced sleep in nocturnal rodents, and mood regulation. It appears that the M1 population of intrinsically-photosensitive retinal ganglion cells (ipRGCs) are responsible for the circadian light inputs to the suprachiasmatic nucleus (SCN) while the other ipRGC subtypes are responsible for both mood regulation and photosomnolence. Meanwhile, circadian inputs also affect mood via the locus coeruleus (LC). However, it appears that the long-hypothesized direct inputs from the SCN to the orexin neurons that project to the LC may not exist and that the relay between the SCN and the LC is likely the subparaventricular zone (SPZ). Therefore, the SPZ could act as an interpretive signal of circadian outputs from the SCN, possibly even regulating processes as fundamental as whether species are nocturnal or diurnal. On the flip side of the circadian system projecting to arousal-promoting circuitry, interesting hints were given as to the possibility that the circadian system may also influence the various sleep-promoting areas found in recent years. The most developed of these was the case that VIP neurons in the SCN influences the timing of the well-recognized “nap” found during the late active phase in mice allowed free access to running wheels. Altogether, the daily discussions, followed by spirited debates during the plenary sessions (why do we sleep?) provided an excellent atmosphere for those of us interested in the intersection between these two fields.

Impressions from a chronobiologist - Emily Manoogian, PhD
Salk Institute for Biological Studies, La Jolla, CA, USA

The ASCS was a wonderful and interactive experience. ASCS is combination of cutting edge sleep and circadian research in both humans and model organisms attended by leaders in the both fields.

I was lucky enough to be a speaker at the conference and following the talk, I received great questions from both sides. Questions and comments from the sleep researchers were especially helpful as they drew my attention to questions I hadn't previously considered. This is one reason why this conference, and the combination of the two fields was so helpful. Both sleep and circadian researchers also use similar tools, so updates on what is being used, and new devices that are becoming available were very interesting. However more than anything, it was abundantly clear that sleep and circadian rhythms are inherently intertwined. It is almost impossible to alter one system without affecting the other. Thus, we must all be diligent to understand both systems and keep it in mind when designing experiments and interpreting our findings.

This meeting will be held every other year, and falls on SRBR off years, which makes it a wonderful way to stay in contact with your chronobiology colleagues and meet new sleep researchers at the same time.

Impressions from a chronobiologist who also studies sleep - Carmel A. Martin-Fairey, PhD
Washington University in St. Louis, MO, USA

The impact of seeing the leaders in the circadian and sleep fields come together and speak to a more jointly fashioned future was as informative as it was powerful.

At the first mention of ASCS meeting and its mission, I was immediately intrigued. Recently, I have taken on a project that involves both humans and mice where some of the most compelling findings are actually in measures of sleep. I was completely impressed and engaged by the collaborative nature of the talks and poster sessions. There were a number of speakers who really went the extra mile to bridge the gap between many studies that have a common goal of understanding a disease or condition but approach those questions from a sleep or circadian centric point of view. These speakers highlighted what we can learn from open and honest dialogue between sleep and circadian researchers.

My developmental interests were engaged during the session devoted to development that included Drs. Yagita, Blumberg, Wilhelm, Aton featuring Dr. Mary Carskadon as the discussant. These talks presented data that spanned from the cellular, cell to cell and behavioral readouts of circadian timing and measures of sleep throughout normal and perturbed development in animals and humans. Mary Carskadon summed it up best when she adapted a quote to fit the session, that said it is not one (REM sleep) or the other (NREM sleep) that are needed, it's all of sleep. More specifically all of sleep timed by the circadian system. Honestly, when I heard this I thought it was the theme and mission of the meeting. Both the circadian and sleep systems are adaptive in the powerful model systems we have to study development at the cellular, cell to cell and behavioral levels presented in this session. Ultimately, the data presented by the speakers, emphasized the synergy, integration and adaptation present during normal development.

Combined meetings such as ASCS serve as a valuable resource for us all. The discussion of responsible use of our findings in future applications and translations was a phenomenal and needed conversation.

Conclusion

ASCS 2019 was a productive and inspiring conference. Both sleep and circadian researchers benefited greatly from each other's insight and we look forward to the next ASCS in 2021.

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