XLVIII Reunión Anual de la Sociedad Argentina de Biofísica

Libro de Resúmenes

SAB
XLVIII

27 al 29 de noviembre de 2019
Universidad Nacional de San Luis

XLVIII Reunión Anual de la Sociedad Argentina de Biofísica / compilado por Sebastián Andujar ...
[et al.]. - 1a ed . - Buenos Aires : SAB - Sociedad Argentina de Biofísica, 2019.
Libro digital, PDF

Archivo Digital: descarga
ISBN 978-987-27591-7-9

1. Biofísica. 2. Investigación. I. Andujar, Sebastián, comp.
CDD 570

Diagramación y Edición

M. Soledad Celej, Juan Pablo Acierno

Diseño de Tapa y Logo

Comité Organizador

Asistencia Técnica Web

Juan Pablo Acierno

Sociedad Argentina de Biofísica

Member of the International Union for Pure and Applied Biophysics

XLVIII Reunión Anual SAB

27-29 Noviembre 2019

San Luis, Argentina

XLVIII Annual Meeting SAB

27-29 November 2019

San Luis, Argentina

Organizing Committee

Sebastián Andujar
IMIBIO-CONICET UNSL, San Luis

M. Soledad Celej
CIQUIBIC-CONICET UNC, Córdoba

Nadia S. Chiaramoni
IMBICE-CONICET UNQ, Quilmes

Ricardo D. Enriz
IMIBIO-CONICET UNSL, San Luis

Francisco Garibotto
IMIBIO-CONICET UNSL, San Luis

Osvaldo Martin
IMASL-CONICET UNSL, San Luis

Jorge Vila
IMASL-CONICET UNSL, San Luis

Collaborators (grad students)

Agustina Arroyuelo
IMASL-CONICET UNSL, San Luis

Pedro Ramírez
IMASL-CONICET UNSL, San Luis

Ezequiel Frigini
IMASL-CONICET UNSL, San Luis

Luisa Goicoechea Moro
IMIBIO-CONICET UNSL, San Luis

Silvina Cabañez
IMIBIO-CONICET UNSL, San Luis

Antonella Bonvillani
IMIBIO-CONICET UNSL, San Luis

Scientific Committee

Sebastián Andujar
IMIBIO-CONICET UNSL, San Luis

Mario Del Pópolo
ICB-CONICET UNCU, Mendoza

M. Soledad Celej
CIQUIBIC-CONICET UNC, Córdoba

Nadia S. Chiaramoni
IMBICE-CONICET UNQ, Quilmes

Ricardo D. Enriz
IMIBIO-CONICET UNSL, San Luis

Francisco Garibotto
IMIBIO-CONICET UNSL, San Luis

Gabriel Longo
INIFTA-CONICET, La Plata

Osvaldo Martin
IMASL-CONICET UNSL, San Luis

Sergio Pantano
Institute Pasteur Montevideo
Uruguay

Jorge Vila
IMASL-CONICET UNSL, San Luis

SAB Young Researchers Committee

Ezequiel Frigini
IMASL-CONICET UNSL, San Luis

M. Florencia González Lizarraga
IMMCA-CONICET, San Miguel de Tucumán

Agustín Mangiarotti
INIMEC-CONICET, Córdoba

Patricia Maturana
CIBAAL-CONICET UNSE, Santiago del Estero

Luis Benito Pérez Socas
CIQUIBIC-CONICET UNC, Córdoba

Macarena Siri
CIQUIBIC-CONICET UNC, Córdoba

SAB Executive Committee

President	José María Delfino IQUIFIB-CONICET, FFyB-UBA, Buenos Aires
Vicepresident	M. Soledad Celej CIQUIBIC-CONICET, FCQ-UNC, Córdoba
Past President	Lía Pietrasanta IFIBA-CONICET, FCEN-UBA, Buenos Aires
Secretary	Ernesto Ambroggio CIQUIBIC-CONICET, FCQ-UNC, Córdoba
Treasurer	Noelia Burgardt IQUIFIB-CONICET, FFyB-UBA, Buenos Aires
Board members	César Ávila IMMCA-CONICET, FBQyF-UNT, San Miguel de Tucumán
	Axel Hollmann CIBAAL-CONICET, UNSE, Santiago del Estero
	Irene Mangialavori IQUIFIB-CONICET, FFyB-UBA, Buenos Aires
	Santiago Di Lella IQUIBICEN-CONICET, FCEyN-UBA, Buenos Aires

Hydrogen bonds and water in steroid-containing phospholipidic membranes assessed by near infrared spectroscopy

Wenz JJ[a]

a - Instituto de Investigaciones Bioquímicas de Bahía Blanca (INIBIBB). Departamento de Biología, Bioquímica y Farmacia, Universidad Nacional del Sur (UNS- CONICET), Bahía Blanca, Argentina

Near infrared spectroscopy (NIR) is useful to study the H-bonds network in water systems, which are sensitive to solutes. The less the number and/or the strength of H-bonds, the more the strength of the covalent O-H bonds of water. Hence, they vibrate and absorb radiation at higher frequencies. By taking advantage of this spectral shift water in DMPA membranes with and without one of two steroids, progesterone and 25-hydroxycholesterol, was assessed.

Spectra of vesicles of DMPA and DMPA/steroid in MilliQ water (500 µM; 80:20 molar ratio for the steroid-containing samples) between 1100 and 2300 nm were acquired at 10 temperatures in the range 13-58 °C, with a path length of 1 mm. For understanding the tangled spectra, principal component analysis was applied to disclose subtle changes mirroring the alterations in the vibrational energy of the O-H bonds, as an indirect measure of the H-bond network. The analysis encompassed the first overtone of water (centered at 1450/1455 nm) representing signals of overlapping water and O-H stretching bands, as well as a limited portion of 1100-1300 nm.

The shift to higher frequencies (i.e. higher energy) of the O-H vibration band with increasing temperatures or in the presence of 25-hydroxycholesterol is consistent with a strengthening of the O-H bonds caused by disruption/weakening of the H-bonds. The number of strongly H-bonded waters decreases whereas the number of weakly H-bonded waters increases. The observed shift agrees with reports about the distinct absorption of three states of water: waters having no -OH bonded, having one -OH group H-bonded and having two -OHs H-bonded. In contrast, DMPA and progesterone did not show significant effects on the H-bonds network. Findings concur with the lipid domain-promoting activity reported for 25-hydroxycholesterol (a cholesterol-like behavior) and with the slightly (or absent) lipid domain-disrupting activity of progesterone.