

Determining the fluid ordered and disordered phases in a pulmonary surfactant by electron spin resonance technique

Alejandra Cimato

Universidad de Buenos Aires, Buenos Aires, Argentina

Abstract

Pulmonary surfactant main function is to reduce surface tension at alveolar interface. Two lipids phases coexist in surfactant membranes: a liquid-ordered (Lo) and a liquid-disordered (Ld) phases. This coexistence of phases would be crucial for the surfactant activity. Until now, the proportion of phases was determined qualitatively. We design an electronic spin resonance technique to quantify the lipid fraction in Ld phase. An exogenous pulmonary surfactant (EPS) with or without extra Cho was labeled with 5-doxil stearic acid to estimate the membrane fluidity and with TEMPO to determine the PL in Ld phase. A unique equation was established for the calculation of PL in Ld phase with an error of less than 3%. TEMPO partition coefficient was (0.78 ± 0.03) . Cholesterol added to EPS did not modify this coefficient. The equation is valid for different batches of surfactant regardless of the cholesterol content. The proposed method is simple, precise and allows evaluating changes in lateral structure that could affect surfactant biophysical properties.

Received: May 5, 2022; **Accepted:** May 11, 2022; **Published:** May 24, 2022

Biography

Gonzalo Labarca MD, FACP is a Research Fellow in Medicine of the Brigham and Women's Hospital, Harvard Medical School. Dr. Labarca is a physician-scientist with a research focus on the investigation of pathways that modulate the relationship between Obstructive Sleep Apnea and worse health outcomes

as well as evidence-based medicine in Sleep Apnea. Dr. Labarca's research is funded by the National Institute of Health, but he has also procured funding from the American Academy of Sleep Medicine, And the Agencia Nacional de Investigacion y Desarrollo, the Chilean Government.