

Monday, April 26, 2010

**POSTER SESSION: BIOESSENTIAL ELEMENTS THROUGH SPACE AND TIME**  
**6:00 p.m. Marina Plaza Ballroom**

Percak-Dennett E. M. Roden E. E. Johnson C. M.

[Evaluation of Dissimilatory Microbial Iron Oxide Reduction as a Mechanism for the Generation of Banded Iron Formation Minerals](#) [#5247]

This research seeks to define the potential for dissimilatory microbial Fe(III) oxide reduction to generate Fe(II)-bearing minerals, analogous to those found in BIFs, in reaction systems that mimick conditions in Archean ocean sediments.

Ludois J. M. Heimann A. Johnson C. M. Beard B. L. Valley J. W. Roden E. E. Spicuzza M. J.

[Sr Isotopes of Banded Iron Formation Carbonates: An Argument Against Iron Carbonates Precipitating from Sea Water](#) [#5314]

This is a study of the Sr isotopic composition coupled with previously determined Fe, O, and C isotopic data of banded iron formation carbonates to assess if such carbonates precipitated in equilibrium with seawater.

Fike D. A. Orphan V. J.

[High Resolution SIMS-based Sulfide δ<sup>34</sup>S: A New Approach for Characterizing Microbial Metabolic Activity](#) [#5411]

We use secondary ionization mass spectrometry (SIMS) to collect micron-scale sulfur isotopic data, which are used to probe microbial metabolic activity in environments with sharp redox gradients, such as microbial mats and deep sea methane seeps.

Glass J. B. Wolfe-Simon F. L. Poret-Peterson A. T. Anbar A. D.

[Signatures of Low-Mo Ancient Ocean May be Preserved in Cyanobacterial Genomes](#) [#5418]

Before 800 million years ago, Mo was scarce in the ocean. We present evidence that primitive cyanobacteria store Mo using a protein called "Mop." Mop genes preserved in modern genomes may be signatures of the imprint of ancient Mo limitation.

Miyazaki J. Chang Q. Senda R. Suzuki K. Takai K.

[Metals in Microbes, A Potential Biosignature for the Early Life](#) [#5235]

There is an interesting question which energy metabolisms did maintain the early life activity? To clarify this very attractive question, we have expected that metals in microbes are one of possible biosignature for seeking the early life.

Hemp J. Pace L. A.

[Evolution of Aerobic Respiration](#) [#5624]

We analyzed all of the currently available microbial genomes demonstrate that aerobic respiration originated within early Cyanobacteria after the evolution of oxygenic photosynthesis.

Chopra A. Lineweaver C. H.

[Sun → Earth → Crust → Life: Quantifying the Elemental Fractionations that led to Life on Earth](#) [#5547]

We quantify and interpret the fractionation of elements that led from the Sun to the Earth, to the Earth's crust, to the environments of life's origin and finally to life itself.

Chopra A. Lineweaver C. H.

[The Stoichiometry of the Essential Elements of Life](#) [#5561]

Life is composed of the chemical elements available in its environment, but not in the exact abundances as in the environment. We quantify and interpret these differences in terms of chemical constraints on metabolic pathways.

Young P. A. Timmes F. X. Tr'Ehn N.

[The Turbulent Origin of the Elements: Dynamical/Chemical Evolution and Explosions of Massive Stars and Implications for Astrobiology](#) [#5395]

We seek to quantify nucleosynthesis in stars of initial mass 8–100 M<sub>⦿</sub> using the TYCHO stellar evolution code, producing a set of supernova progenitors for later use in 1D and 3D explosion codes for ejecta chemical abundances and distributions.

Siluvai G. S. Towey B. Szilagyi R. K.

[Activation of Fe-S Systems for Catalysis by Heterometal Substitution](#) [#5528]

Using the example of MoFe<sub>3</sub>S<sub>4</sub> cubanes we have started to gain insights into how in general these structural and electronic parameters can facilitate activation of small inorganic molecules toward biologically more relevant organic molecules under early earth conditions.

Nishizawa. M. Miyazaki J. Takai K.

[Isotopic Effects and Kinetics of Nitrogen Fixation by Hyperthermophilic Methanogen: Insight into Nitrogen Biogeochemistry in the Contemporary and Ancient Hydrothermal Ecosystem](#) [#5217]

To evaluate the contribution of N<sub>2</sub> fixation to N budget in the contemporary and ancient hydrothermal ecosystem, we measured isotopic effects and kinetics of N<sub>2</sub> fixation by hyperthermophilic methanogen under various culture conditions.