

**AAPG Annual Convention  
Salt Lake City, Utah  
May 11-14, 2003**

Ernest A. Mancini<sup>1</sup>, Marcos Aurell<sup>2</sup>, Beatriz Bádenas<sup>2</sup>, William C. Parcell<sup>3</sup>, Juan Carlos Llinas<sup>1</sup> (1) University of Alabama, Tuscaloosa, AL (2) Universidad de Zaragoza, 50009 Zaragoza, Spain (3) Wichita State University, Wichita, KS

### **Upper Jurassic Microbial Outcrop Analogs for Characterization of Thrombolitic Reservoirs in the Northern Gulf of Mexico**

Upper Jurassic (Oxfordian) Smackover microbial reef buildups in the northern Gulf of Mexico consist primarily of shallow water thrombolites that developed on hardgrounds chiefly associated with Paleozoic basement paleohighs. These layered and dendroidal thrombolites are typically associated with late transgressive to early highstand systems tract deposits and range up to 45 m in thickness. Because the Smackover strata are not exposed at the surface in this region, determination of the geometries and extent of these thrombolitic buildups, which are critical in designing hydrocarbon exploration and development strategies for the resulting reservoirs, is difficult. Upper Jurassic (Oxfordian and Kimmeridgian) microbial buildups are exposed in Western Europe where they are associated with late transgressive to highstand systems tract deposits and sediment starvation surfaces and hardgrounds. In the Ardennes-Lorraine region of France, platform thrombolitic buildups have been observed in outcrop to not exceed 3 m in thickness. In the Iberian Basin of Spain, thrombolitic-coral pinnacle reefs in mid ramp environments are composed of up to 60 to 80% microbial crusts and are 16 m in thickness. In the Algarve Basin of Portugal, microbial reefs in distal ramp settings consist of pure thrombolitic buildups that attain thicknesses of 30 m. The use of Upper Jurassic microbial reef outcrops to characterize and model the Smackover thrombolitic reefs in the subsurface of the Gulf of Mexico greatly facilitates the design of hydrocarbon development and exploration strategies for delineating microbial reefs through 3-D geologic and seismic modeling.