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Ferric citrate fermentation by a *Klebsiella oxytoca* strain isolated from pyrite mine drainage producing a relevant exopolysaccharide and its potential applications

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A *Klebsiella oxytoca* strain BAS-10 was isolated from pyrite mine drainages. This enterobacter ferments Fe(III)-citrate and Na(I)-citrate. Physiological studies on a relative species *K. pneumoniae* and *Salmonella typhimurium* growing on Na(I)-citrate by fermentative metabolism have been already reported. These strains grow on citrate by Na(I)-dependent pathway, forming acetic acid and CO₂ as final metabolites. Moreover strain BAS-10 differs from other *Klebsiella* sp. and other citrate fermenting bacteria that it thrives on high concentrations of Fe(III)-citrate and produces at the stationary phase a thick iron gel. This characteristic is due to the fact that strain BAS-10 synthesizes a branched acid exopolysaccharides (ESP) constituted by the following heptasaccharide: 2)- α -Rha-(13)- β -Gal-(12)- α -Rha-(14)- β -GlcA-[β -GlcA-(14)]-(13)- α -Rha-(13)- α -Rha-(12). Recently a regulatory network was disclosed by proteomic analyses of iron-dependent cell processes of Fe(III)-citrate fermentation (3). This wild strain, adapted to mine drainages, copes with iron and other heavy metal toxicity by complexing them outside with EPS. Different metal-EPS had been prepared for nutraceutical, catalysis reactions and antibiotic properties depending on the metal linked to the EPS.

Biography

Franco Baldi has completed his study at University of Siena (Italy) at the age of 24 years became Researcher in 1981 at the same University. He was a recipient of several fellowships in England, France, and United states. In 1998, through a national competition, he became Associate Professor and in 2005 won the full professorship of General Microbiology at Cà Foscari University, Venice, Italy. He has published more than 100 papers of which 74 are by Scopus retrieved. The scientific interest is on microbial degradation of pollutants and in particular on microbes-metals interactions and their potential biotechnological applications.

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