

Isolation and Characterization of a Novel *n*-Alkane-Degrading Strain, *Acinetobacter haemolyticus* AR-46

Zoltán Bihari^{a,*}, Aladár Pettkó-Szandtner^b, Gyula Csanádi^c, Margit Balázs^a, Péter Bartos^a, Péter Kesserű^a, István Kiss^a, and Imre Mécs^a

^a Institute for Biotechnology, Bay Zoltán Foundation for Applied Research, Derkovits fasor 2., H-6726 Szeged, Hungary. E-mail: bihari@bay.u-szeged.hu

^b Institute of Plant Biology, Biological Research Centre, Hungarian Academy of Sciences, Temesvári körút 62., P. O. Box 521, H-6701 Szeged, Hungary

^c Department of Biotechnology, University of Szeged, Temesvári körút 62., H-6701 Szeged, Hungary

* Author for correspondence and reprint requests

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Strain AR-46, isolated and identified as *Acinetobacter haemolyticus*, evolutionally distant from the known hydrocarbon-degrading *Acinetobacter* spp., proved to have excellent long-chain *n*-alkane-degrading ability. This is the first detailed report on an *n*-alkane-utilizing strain belonging to this species. The preferred substrate is *n*-hexadecane, with an optimal temperature of 37 °C under aerobic conditions. Five complete and two partial open reading frames were sequenced and correlated with the early steps of monoterminal oxidation-initiated *n*-alkane mineralization. The encoded protein sequences and the arrangement of these genes displayed high similarity to those found in *Acinetobacter* sp. M-1, but AR-46 seemed to have only one alkane hydroxylase gene, with a completely different induction profile. Unique behaviour was also observed in *n*-alkane bioavailability. Substrate uptake occurred through the hydrophobic surface of *n*-alkane droplet-adhered cells possessing long, thick fimbriae, which were presumed to play a major role in *n*-alkane solubilization. A majority of the cells was in detached form, with thick, but short fimbriae. These free cells were permanently hydrophilic, unlike the cells of other *Acinetobacter* strains.

Key words: *n*-Alkane, *alkM* Induction, Direct Adherence