

## Supplementary Material

### Enhanced bacterial growth and gene expression of D-amino acid dehydrogenase with D-glutamate as a sole carbon source

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**Supplementary Table S3.** Cultured cell mass (wet weight, g) and activity of D-amino acid dehydrogenase (DAD) with ferricyanide<sup>3-</sup> or NAD<sup>+</sup> as an oxidant in each 20-mL liquid culture of strain A25, *Raoultella ornithinolytica* JCM 6096<sup>T</sup> and *Pseudomonas aeruginosa* JCM 5962<sup>T</sup>. The DAD activity was measured by spectrophotometry and is represented based on the changes in optical density (OD) in liquid-culture supernatants and pelletized-cell extracts. Timings of measurements were determined referring to the maximum cell density (OD<sub>600</sub>) as: 1/4 Max (early exponential phase), 1/2 Max (mid-exponential phase) and Max with approximately 1/4, 1/2 and 1/1 of the maximum OD<sub>600</sub>, respectively, as well as stationary phase (Stat.) about 5-12 hours after Max.

#### A25 - Ferricyanide

Time		Cell mass	Total DAD activity in a 20-mL culture					Total DAD activity per cell mass (g <sup>-1</sup> )				
			Whole super.		Whole cell ext.		Sum	Culture super.		Cell extract		Sum
T	h	g	Ave	SD	Ave	SD	Ave	Ave	SD	Ave	SD	Ave
1/4 Max	21	0.082	0.246	0.018	0.148	0.001	0.394	2.994	0.216	1.810	0.011	4.804
1/2 Max	42	0.144	1.133	0.022	0.216	0.004	1.349	7.865	0.151	1.500	0.029	9.365
Max	92	0.268	0.388	0.018	0.060	0.000	0.448	1.448	0.066	0.224	0.000	1.672
Stat.	102	0.259	0.578	0.022	0.065	0.001	0.643	2.232	0.084	0.250	0.004	2.482

#### *Raoultella ornithinolytica* JCM 6096<sup>T</sup> - Ferricyanide

Time		Cell mass	Total DAD activity in a 20-mL culture					Total DAD activity per cell mass (g <sup>-1</sup> )				
			Whole super.		Whole cell ext.		Sum	Culture super.		Cell extract		Sum
T	h	g	Ave	SD	Ave	SD	Ave	Ave	SD	Ave	SD	Ave
1/4 Max	67	0.040	0.119	0.000	0.089	0.005	0.208	2.970	0.000	2.230	0.120	5.200
1/2 Max	84	0.079	0.246	0.033	0.176	0.000	0.422	3.108	0.419	2.228	0.000	5.336
Max	120	0.155	0.475	0.000	0.038	0.004	0.514	3.066	0.000	0.248	0.025	3.314
Stat.	130	0.144	0.277	0.000	0.053	0.002	0.330	1.925	0.000	0.369	0.012	2.294

#### *Pseudomonas aeruginosa* JCM 5962<sup>T</sup> - Ferricyanide

Time		Cell mass	Total DAD activity in a 20-mL culture					Total DAD activity per cell mass (g <sup>-1</sup> )				
			Whole super.		Whole cell ext.		Sum	Culture super.		Cell extract		Sum

T	h	g	Ave	SD	Ave	SD	Ave	Ave	SD	Ave	SD	Ave
1/4 Max	17	0.114	0.642	0.018	0.054	0.002	0.695	5.627	0.155	0.470	0.019	6.098
1/2 Max	30	0.208	0.863	0.018	0.196	0.004	1.059	4.150	0.085	0.942	0.018	5.093
Max	75	0.310	0.000	0.028	0.050	0.000	0.050	0.000	0.090	0.161	0.000	0.161
Stat.	80	0.299	0.000	0.000	0.077	0.002	0.077	0.000	0.000	0.257	0.006	0.257

**A25 - NAD**

Time		Cell mass	Total DAD activity in a 20-mL culture					Total DAD activity per cell mass (g <sup>-1</sup> )				
			Culture super.		Cell extract		Sum	Culture super.		Cell extract		Sum
T	h	g	Ave	SD	Ave	SD	Ave	Ave	SD	Ave	SD	Ave
1/4 Max	21	0.082	0.451	0.035	0.060	0.000	0.511	5.505	0.432	0.732	0.000	6.237
1/2 Max	42	0.144	1.212	0.045	0.306	0.004	1.518	8.415	0.314	2.125	0.026	10.540
Max	92	0.268	2.416	0.028	0.386	0.001	2.801	9.013	0.104	1.439	0.003	10.452
Stat.	102	0.259	3.588	0.035	0.557	0.003	4.145	13.852	0.137	2.150	0.012	16.002

***Raoultella ornithinolytica* JCM 6096<sup>T</sup> - NAD**

Time		Cell mass	Total DAD activity in a 20-mL culture					Total DAD activity per cell mass (g <sup>-1</sup> )				
			Whole super.		Whole cell ext.		Sum	Culture super.		Cell extract		Sum
T	h	g	Ave	SD	Ave	SD	Ave	Ave	SD	Ave	SD	Ave
1/4 Max	67	0.040	0.086	0.001	0.402	0.001	0.488	2.140	0.022	10.060	0.022	12.200
1/2 Max	84	0.079	1.085	0.060	0.103	0.002	1.188	13.735	0.760	1.306	0.023	15.041
Max	120	0.155	2.328	0.043	0.245	0.002	2.574	15.022	0.280	1.582	0.015	16.604
Stat.	130	0.144	2.067	0.081	0.296	0.004	2.363	14.355	0.564	2.053	0.025	16.408

***Pseudomonas aeruginosa* JCM 5962<sup>T</sup> - NAD**

Time		Cell mass	Total DAD activity in a 20-mL culture					Total DAD activity per cell mass (g <sup>-1</sup> )				
			Whole super.		Whole cell ext.		Sum	Culture super.		Cell extract		Sum
T	h	g	Ave	SD	Ave	SD	Ave	Ave	SD	Ave	SD	Ave
1/4 Max	17	0.114	1.560	0.082	0.132	0.004	1.693	13.686	0.720	1.161	0.036	14.848
1/2 Max	30	0.208	3.485	0.000	0.382	0.000	3.867	16.754	0.000	1.837	0.000	18.590
Max	75	0.310	5.504	0.000	0.625	0.005	6.130	17.756	0.000	2.017	0.017	19.773
Stat.	80	0.299	8.482	0.071	0.702	0.002	9.184	28.369	0.237	2.346	0.006	30.715