

**Supplemental Table 1(d). Actinobacterial signature proteins which are mainly lost in *Bifodobacterium longum*, *Tropheryma whipplei*, *Leifsonia xyli* and *Corynebacterium* species.**

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<b>Protein</b>	<b>ML0115</b> [NP_301211]	<b>ML1299</b> [NP_301933]	<b>Tfu_0030</b> [YP_288091]	<b>Tfu_0751</b> [YP_288812]	<b>Tfu_1240</b> [YP_289301]	<b>Tfu_1340</b> [YP_289401]
<b>Length</b>	<b>174 aa</b>	<b>196 aa</b>	<b>103 aa</b>	<b>280 aa</b>	<b>153 aa</b>	<b>120 aa</b>
<b>Possible function</b>	Unknown	Unknown	Unknown	acetyltransferase	Unknown	Unknown
<i>Mycobacterium leprae</i>	3e-81 (174)	7e-98 (196)	---	---	---	---
<i>Mycobacterium tuberculosis</i>	3e-64 (178)	8e-86 (195)	2e-29 (105)	1e-54 (284)	1e-06 (115)	2e-12 (115)
<i>Mycobacterium avium</i>	1e-63 (168)	1e-87 (195)	7e-30 (104)	1e-54 (284)	6e-07 (115)	1e-11 (115)
<i>Mycobacterium bovis</i>	3e-64 (178)	8e-86 (195)	2e-29 (105)	1e-54 (284)	1e-06 (115)	2e-12 (115)
<i>Nocardia farcinica</i>	1e-52 (204)	1e-66 (194)	---	1e-54 (287)	1e-37 (150)	9e-09 (150)
<i>Streptomyces avermitilis</i>	2e-49 (181)	5e-37 (196)	3e-32 (98)	2e-88 (295)	9e-41 (151)	6e-26 (135)
<i>Streptomyces coelicolor</i>	6e-49 (179)	1e-34 (196)	3e-32 (98)	7e-83 (287)	3e-57 (156)	3e-14 (142)
<i>Thermobifida fusca</i>	4e-49 (186)	7e-36 (188)	3e-55 (103)	3e-149 (280)	3e-88 (153)	1e-64 (120)
<i>Propionibacterium acnes</i>	---	2e-23 (193)	7e-32 (103)	6e-42 (281)	---	---
<i>Nocardioides sp.</i>	4e-50 (192)	7e-31 (191)	8e-34 (98)	3e-60 (281)	7e-16 (137)	3e-18 (150)
<i>Frankia sp. Ccl3</i>	9e-47 (190)	1e-35 (180)	1e-31 (124)	7e-83 (283)	3e-04 (180)	4e-07 (180)
<i>Frankia sp. EAN1pec</i>	3e-46 (210)	1e-20 (171)	6e-31 (165)	8e-88 (283)	4e-12 (153)	3e-14 (153)
<i>Kineococcus radiotolerance</i>	1e-44 (201)	---	1e-29 (161)	8e-71 (291)	2e-07 (253)	3e-15 (144)
<i>Brevibacterium linens</i>	6e-32 (174)	7e-28 (187)	---	4e-38 (292)	4e-09 (153)	3e-15 (118)
<i>Arthrobacter sp.</i>	4e-38 (207)	2e-22 (183)	9e-28 (94)	4e-46 (295)	3e-18 (146)	3e-09 (245)
<i>Non-Actinobacteria</i>	0.26 (312)		2.6 (4448)	1e-04 (260)	0.002 (124)	
	<i>Rattus sp.</i>	See note 1	<i>Trypanosoma brucei</i>	<i>Bacillus halodurans</i> 42/79 (53%).	<i>Magnetospirillum magnetotacticum</i>	See note 2

1. Also found in *Chloroflexus aurantiacus* J-10-fl with E-value of 6e-14 (175 aa) [EAO60924]; and the next non-actinobacterial hit is *Silicibacter pomeroyi* ( $\alpha$ -proteobacteria) with E-value of 3.0 (329 aa);
2. Also found in *M. magnetotacticum* MS-1 with E-value of 3e-11 (124) [ZP\_00049792]; and the next non-actinobacterial hit is *Anaeromyxobacter dehalogenans* ( $\delta$ -proteobacteria) with E-value of 0.001 (125 aa).