

## Learning set of microbial isolate strains used in this study

We used and extended a manually curated set of lignocellulose and non-lignocellulose degrading microbial strains [1]. For our study, we identified 20 additional lignocellulose-degrading strains from the literature (see Methods), which are marked by bold numbers in the following table. The symbol \* marks strains for which we provide another reference than the genome publication characterizing the metabolic capacities of the respective strain.

	Microbial strain	Reference	
Lignocellulose degrading organisms	1	<i>Acidothermus cellulolyticus</i> 11B	Barabote et al 2009 [2]
	2	<i>Caldicellulosiruptor bescii</i> Z-1320, DSM 6725 (' <i>Anaerocellum thermophilum</i> ')	Yang et al 2009 [3]
	3	<i>Bryantella formatexigens</i> I-52, DSM 14469	Wolin et al 2003 [4]
	4	<i>Caldicellulosiruptor saccharolyticus</i> DSM 8903	Rainey et al 1994* [5]
	5	<i>Cellulomonas flavigena</i> 134, DSM 20109	Abt et al 2010 [6]
	6	<i>Cellvibrio japonicus</i> Ueda 107	DeBoy et al 2008 [7]
	7	<i>Clostridium cellulolyticum</i> H10	Petitdemange et al 1984* [8]
	8	<i>Clostridium phytofermentans</i> ISDg	Warnick et al 2002* [9]
	9	<i>Clostridium thermocellum</i> ATCC 27405	Feinberg et al 2011 [10]
	10	<i>Cytophaga hutchinsonii</i> ATCC 33406	Xie et al 2007 [11]
	11	<i>Dictyoglomus turgidum</i> DSM 6724	Brumm et al 2011 [12]
	12	<i>Fibrobacter succinogenes succinogenes</i> S85	Bae et al 1993* [13]
	13	<i>Ruminococcus flavefaciens</i> FD-1	Berg Miller et al 2009 [14]
	14	<i>Saccharophagus degradans</i> 2-40	Fraiberg et al 2010 [15]
	15	<i>Teredinibacter turnerae</i> T7901	Yang et al 2009 [16]
	16	<i>Thermobifida fusca</i> YX	Lykidis et al 2007 [17]
	17	<i>Thermomonospora curvata</i> DSM 43183	Chertkov et al 2011 [18]
	18	<i>Xylanimonas cellulosilytica</i> XIL07, DSM 15894	Foster et al 2010 [19]
	19	<i>Cellulosilyticum lentocellum</i> RHM5, DSM 5427	Miller et al 2011 [20]
	20	<i>Clostridium cellulovorans</i> 743B	Sleat et al 1984 * [21]
	21	<i>Caldicellulosiruptor lactoaceticus</i> 6A	Mladenovska et al * 1995 [22]
	22	<i>Spirochaeta thermophila</i> DSM 6192	Rainey et al * 1991 [23]
	23	<i>Acetivibrio cellulolyticus</i> CD2, DSM 1870	Saddler et al * 1981 [24]
	24	<i>Ruminococcus albus</i> 7	Suen et al 2011 [25]
	25	<i>Ruminococcus albus</i> 8	Devillard et al * 2004 [26]
	26	<i>Butyrivibrio fibrosolvens</i> 16/4	Hespell et al * 1987 [27]
	27	<i>Bacteroides cellulosilyticus</i> DSM 14838	Robert et al * 2007 [28]
	28	<i>Clostridium papyrosolvens</i> DSM 2782	Madden et al * 1982 [29]
	29	<i>Clostridium acetobutylicum</i> ATCC 824	Nölling et al 2001 [30]
	30	<i>Caldicellulosiruptor obsidiansis</i> OB47	Blumer-Schuetz et al 2011 [31]

	<b>31</b>	<i>Caldicellulosiruptor hydrothermalis</i> 108	Blumer-Schuetz et al 2011 [31]
	<b>32</b>	<i>Caldicellulosiruptor kristjanssonii</i> 177R1B, DSM 12137	Blumer-Schuetz et al 2011 [31]
	<b>33</b>	<i>Caldicellulosiruptor kronotskyensis</i> 2002	Blumer-Schuetz et al 2011 [31]
	<b>34</b>	<i>Caldicellulosiruptor owensensis</i> OL	Blumer-Schuetz et al 2011 [31]
	<b>35</b>	<i>Streptomyces lividans</i> TK24	Kluepfel et al * 1986 [32]
	<b>36</b>	<i>Amycolatopsis mediterranei</i> U32	Zhao et al 2010 [33]
	<b>37</b>	<i>Sorangium cellulosum</i> So ce 56	Schneiker et al 2007 [34]
	<b>38</b>	<i>Eubacterium cellulosolvens</i> 6	Flint et al * 2008 [35]
Non-lignocellulose-degrading organisms	1	<i>Acetobacter pasteurianus</i> IFO 3283-01	Azuma et al 2009 [36]
	2	<i>Acidimicrobium ferrooxidans</i> DSM 10331	Clum et al 2009 [37]
	3	<i>Acidithiobacillus ferrooxidans</i> ATCC 23270	Valdés et al 2008 [38]
	4	<i>Actinosynnema mirum</i> DSM 43827	Land et al 2009 [39]
	5	<i>Agrobacterium tumefaciens</i> C58 (Cereon)	Wood et al 2001 [40]
	6	<i>Alcanivorax borkumensis</i> SK2	Schneiker et al 2006 [41]
	7	<i>Alkalilimnicola ehrlichei</i> MLHE-1	Hoefl et al 2007* [42]*
	8	<i>Alkaliphilus metalliredigens</i> QYMF	Fu et al 2009)* [43]
	9	<i>Archaeoglobus fulgidus</i> DSM 4304	Klenk et al 1997 [44]
	10	<i>Arthrobacter aurescens</i> TC1	Mongodin et al 2006 [45]
	11	<i>Azoarcus</i> sp. BH72	Krause et al 2006 [46]
	12	<i>Azorhizobium caulinodans</i> ORS 571	Liu et al 2011 [47]
	13	<i>Azotobacter vinelandii</i> DJ, ATCC BAA-1303	Setubal et al 2009 [48]
	14	<i>Beijerinckia indica indica</i> ATCC 9039	Tamas et al 2010 [49]
	15	<i>Candidatus amoebophilus asiaticus</i> 5a2	Schmitz-Esser et al 2010 [50]
	16	<i>Chloroflexus aurantiacus</i> J-10-fl	Tang et al 2011 [51]
	17	<i>Chromobacterium violaceum</i> ATCC 12472	Brazilian National Genome Project Consortium 2003 [52]
	18	<i>Comamonas testosteroni</i> KF-1	Ma et al 2009 [53]
	19	<i>Cupriavidus taiwanensis</i>	Amadou et al 2008 [54]
	20	<i>Cyanothece</i> sp. ATCC 51142	Welsh et al 2008 [55]
	21	<i>Dehalococcoides ethenogenes</i> 195	Seshadri et al 2005 [56]
	22	<i>Desulfatibacillum alkenivorans</i> AK-01	Callaghan et al 2012 [57]
	23	<i>Desulfitobacterium hafniense</i> DCB-2	Shinoda et al 2006) [58]
	24	<i>Desulfobalobium retbaense</i> DSM 5692	Spring et al 2010 [59]
	25	<i>Desulfomicrobium baculatum</i> DSM 4028	Copeland et al 2009 [60]
	26	<i>Desulfotalea psychrophila</i> LSv54	Rabus et al 2004 [61]
	27	<i>Desulfotomaculum reducens</i> MI-1	Junier et al 2010 [62]
	28	<i>Diaphorobacter</i> sp. TPSYc	Byrne-Bailey et al 2010 [63]
	29	<i>Frankia alni</i> ACN14a	Normand et al 2007 [64]
	30	<i>Geobacter bemidjensis</i> Bem	Aklujkar et al 2010 [65]
	31	<i>Hyperthermus butylicus</i> DSM 5456	Brügger et al 2007 [66]
	32	<i>Klebsiella pneumoniae</i> 342	Yi et al 2010 [67]
	33	<i>Lactobacillus salivarius salivarius</i> UCC118	Jimenez et al 2010 [68]
	34	<i>Magnetococcus</i> sp. MC-1	Schübbe et al 2009 [69]
	35	<i>Marinobacter aquaeolei</i> VT8	Singer et al 2011* [70]
	36	<i>Mesorhizobium loti</i> MAFF303099	Kaneko et al 2000 [71]

37	<i>Metallosphaera sedula</i> DSM 5348	Auernik et al 2008 [72]
38	<i>Methanobrevibacter smithii</i> ATCC 35061	Hansen et al 2011 [73]
39	<i>Methanocaldococcus fervens</i> AG86	Galperin and Cochrane 2009 [74]
40	<i>Methanococcoides burtonii</i> DSM 6242	Saunders et al 2003 [75]
41	<i>Methanocorpusculum labreanum</i> Z	Anderson et al 2009 [76]
42	<i>Methanoculleus marisnigri</i> JR1	Anderson et al 2009 [76]
43	<i>Methanopyrus kandleri</i> AV19	Slesarev et al 2002 [77]
44	<i>Methanosarcina acetivorans</i> C2A	Galagan et al 2002 [78]
45	<i>Methanosphaera stadtmanae</i> DSM 3091	Fricke et al 2006 [79]
46	<i>Methylibium petroleiphilum</i> PM1	Kane et al 2007 [80]
47	<i>Methylocella silvestris</i> BL2	Chen et al 2010 [81]
48	<i>Nautilia profundicola</i> Am-H	Campbell et al 2009 [82]
49	<i>Nitrobacter hamburgensis</i> X14	Starkenburger et al 2008 [83]
50	<i>Nitrosococcus oceani</i> ATCC 19707	Klotz et al 2006 [84]
51	<i>Nitrosomonas europaea</i> ATCC 19718	Chain et al 2003 [85]
52	<i>Nitrosopumilus maritimus</i> SCM1	Walker et al 2010 [86]
53	<i>Nitrospira multiformis</i> ATCC 25196	Norton et al 2008 [87]
54	<i>Nostoc punctiforme</i> PCC 73102	Meeks et al 2001 [88]
55	<i>Paracoccus denitrificans</i> PD1222	Siddavattam et al 2011 [89]
56	<i>Parvibaculum lavamentivorans</i> DS-1	Schleheck et al 2007 [90]
57	<i>Pelotomaculum thermopropionicum</i> SI	Kosaka et al 2008 [91]
58	<i>Persephonella marina</i> EX-H1	Reysenbach et al 2009 [92]
59	<i>Polaromonas naphthalenivorans</i> CJ2	Yagi et al 2009 [93]
60	<i>Pseudomonas mendocina</i> ymp	Guo et al 2011 [94]
61	<i>Pyrobaculum aerophilum</i> IM2	Fitz-Gibbon et al 2002 [95]
62	<i>Pyrococcus abyssi</i> GE5	Cohen et al 2003 [96]
63	<i>Rhizobium etli</i> CFN 42	Fauvart et al 2011 [97]
64	<i>Rhodobacter sphaeroides</i> KD131	Porter et al 2011 [98]
65	<i>Rhodococcus</i> sp. RHA1	Takeda et al 2010 [99]
66	<i>Rhodoferrax ferrireducens</i> T118	Risso et al 2009 [100]
67	<i>Rhodospirillum rubrum</i> ATCC 11170	Munk et al 2011 [101]
68	<i>Sinorhizobium medicae</i> WSM419	Reeve et al 2010 [102]
69	<i>Slackia heliotrinireducens</i> DSM 20476	Pukall et al 2009 [103]
70	<i>Streptococcus thermophilus</i> LMD-9	Sun et al 2011 [104]
71	<i>Sulfolobus acidocaldarius</i> DSM 639	Chen et al 2005 [105]
72	<i>Sulfurospirillum deleyianum</i> DSM 6946	Sikorski et al 2010 [106]
73	<i>Synechococcus elongatus</i> PCC 7942	Holtman et al 2005 [107]
74	<i>Synechococcus</i> sp. CC9605	Jenkins et al 2006)* [108]
75	<i>Syntrophomonas wolfei wolfei</i> Goettingen	Sieber et al 2010 [109]
76	<i>Syntrophus aciditrophicus</i> SB	McInerney et al 2007 [110]
77	<i>Thermotoga lettingae</i> TMO	Zhaxybayeva et al 2009 [111]
78	<i>Thioalkalivibrio</i> sp. HL-EbGR7	Muyzer et al 2011 [112]
79	<i>Thiobacillus denitrificans</i> ATCC 25259	Beller et al 2006 [113]
80	<i>Thiomicrospira crunogena</i> XCL-2	Scott et al 2006 [114]
81	<i>Thiomicrospira denitrificans</i> ATCC 33889	Sievert et al 2008 [115]
82	<i>Zymomonas mobilis mobilis</i> ZM4	Pappas et al 2011 [116]

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