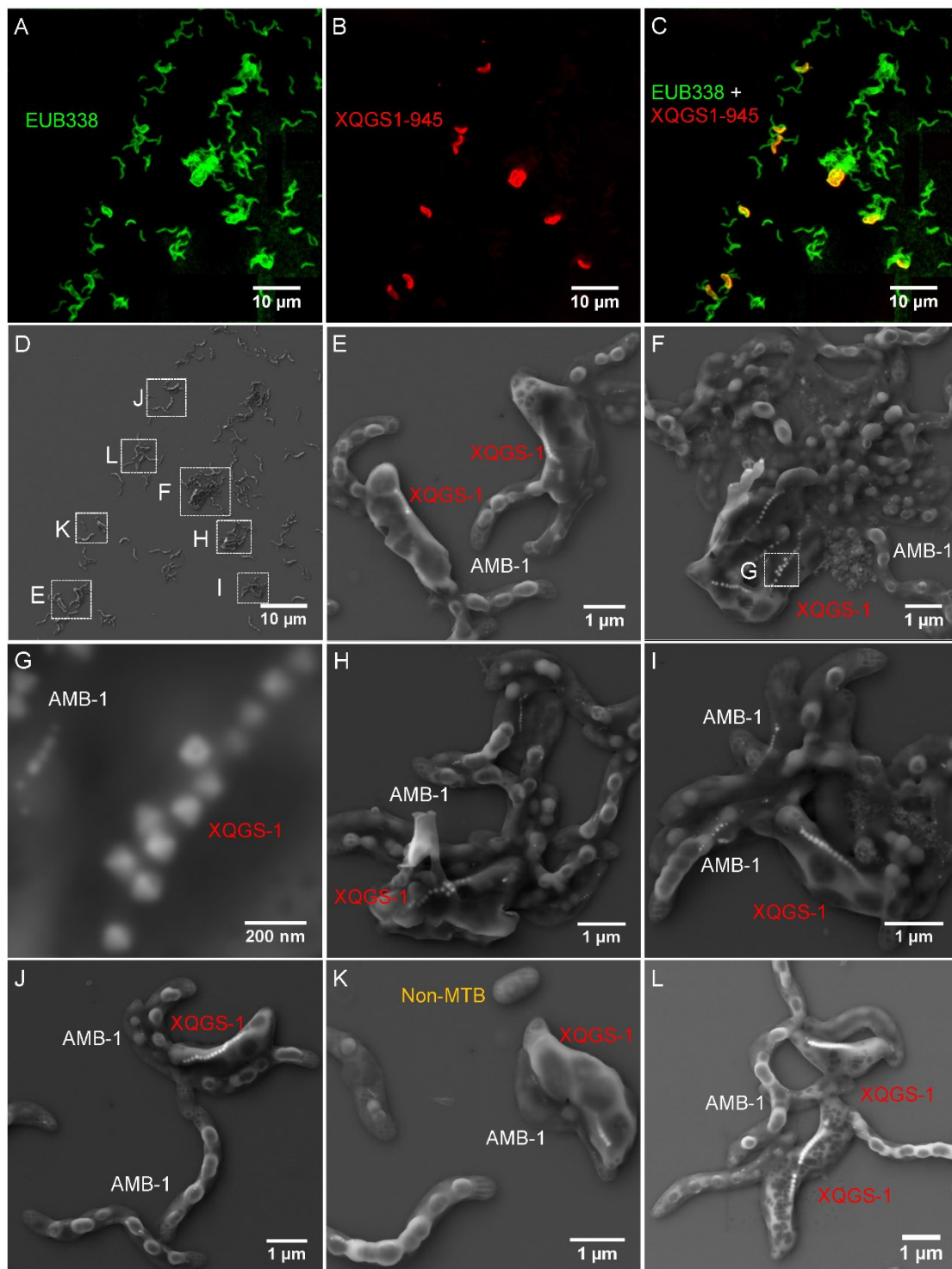


1 SUPPLEMENTAL MATERIAL

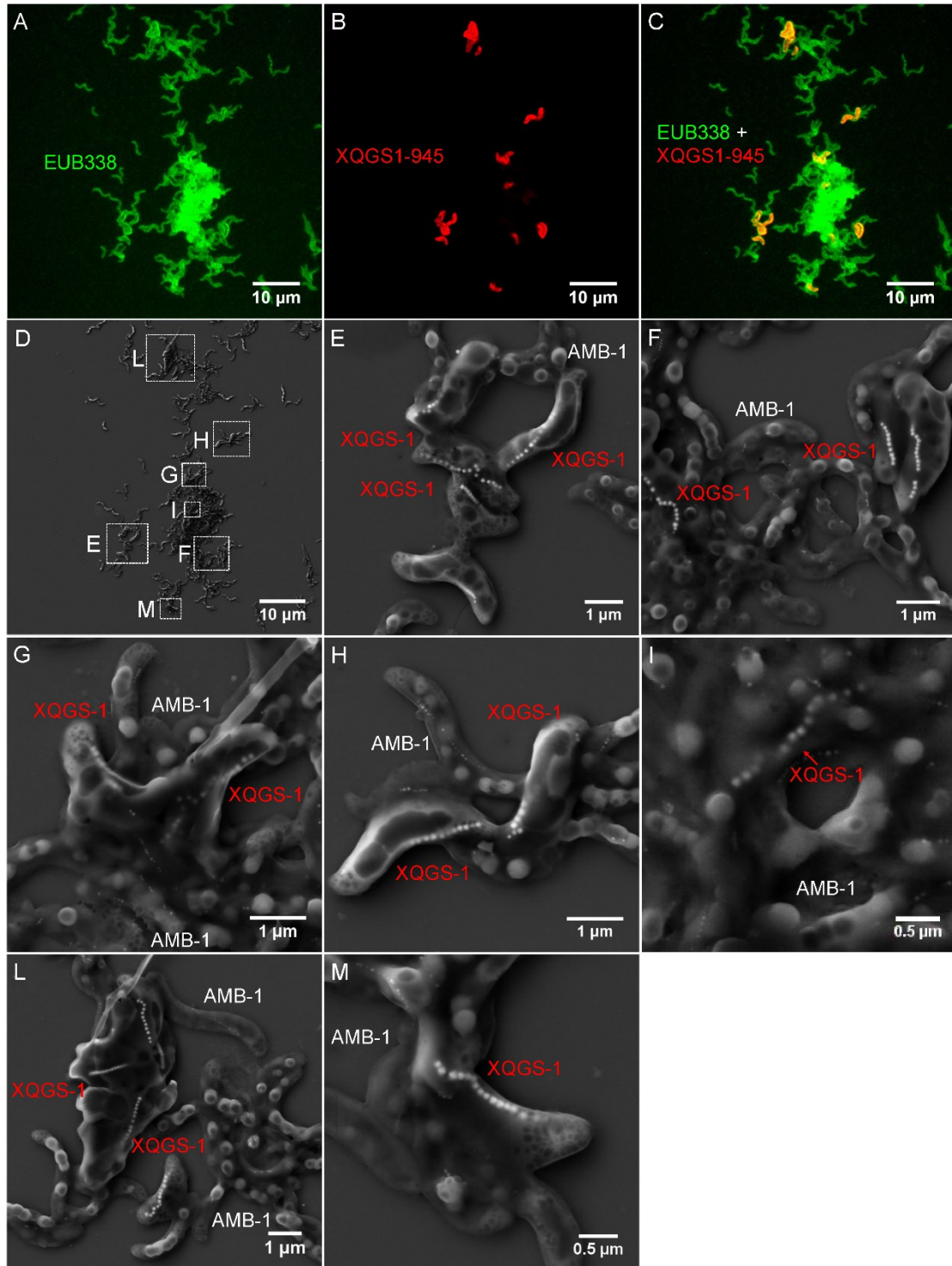


2

3 **FIG S1** Morphological identification of strain XQGS-1 cells with a coupled FISH-SEM
4 approach. (A) Fluorescence micrograph of bacteria hybridized *in situ* with the 5'-FAM-
5 labeled universal bacterial probe EUB338. (B) Fluorescence micrograph of bacteria
6 hybridized *in situ* with the 5'-Cy3-labeled XQGS-1-specific probe XQGS1-945. (C)

7 Overlay of images (A) and (B). (D) Coordinated SEM image of the same field of view
8 as in image (C). (E), (F), (H), (I), (J), (K), and (L) High-magnification SEM image of
9 the boxed areas in (D). (G) Partial enlargement of the boxed area in (F).

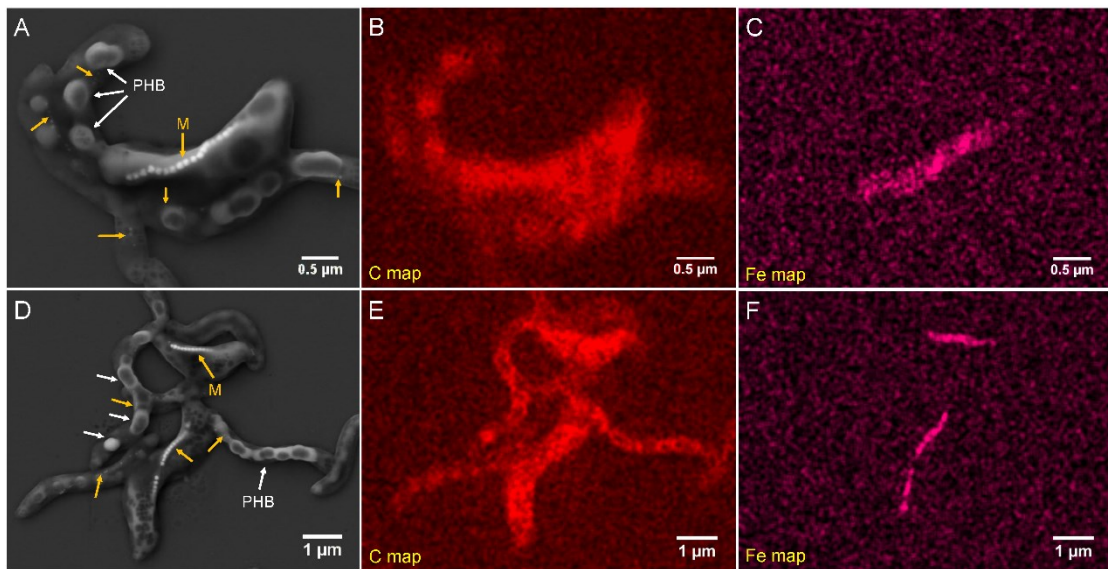
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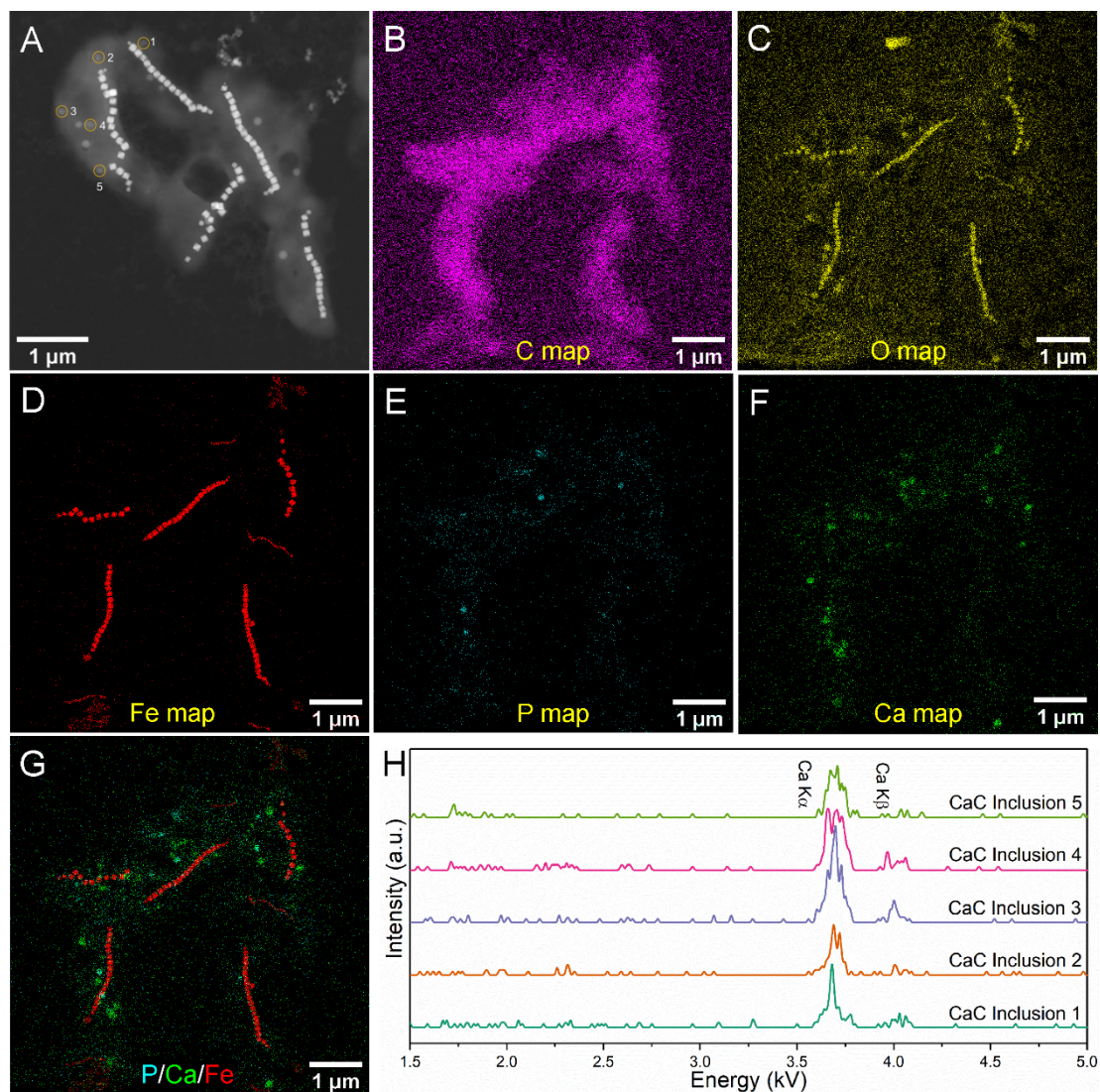
11

12 **FIG S2** Morphological identification of strain XQGS-1 cells with a coupled FISH-SEM

13 approach. (A) Fluorescence micrograph of bacteria hybridized *in situ* with the 5'-FAM-
14 labeled universal bacterial probe EUB338. (B) Fluorescence micrograph of bacteria
15 hybridized *in situ* with the 5'-Cy3-labeled XQGS-1-specific probe XQGS1-945. (C)
16 Overlay of images (A) and (B). (D) Coordinated SEM image of the same field of view
17 as in image (C). (E) - (M) High-magnification SEM image of the boxed areas in (C).
18



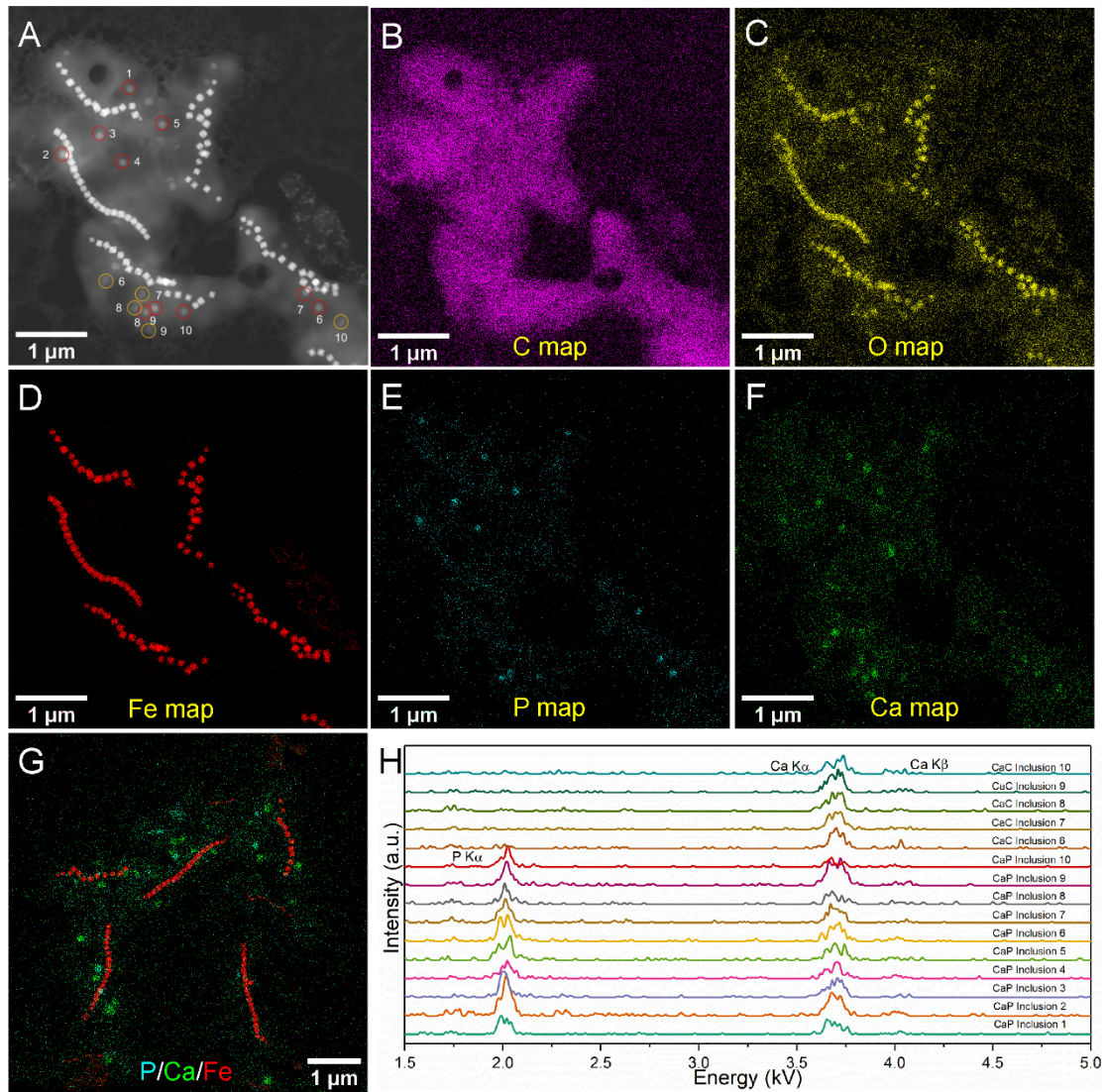
19
20 **FIG S3** EDXS elemental mappings of strains AMB-1 cells with polyhydroxybutyrates
21 (PHB) and magnetosome particles and XQGS-1 cells with magnetosome particles used
22 for coupled FISH-SEM experiments. (A) and (D) SEM images according with FIG S1I
23 and FIG 1G. (B) and (E) EDXS elemental maps of C (C K α). (C) and (F) EDXS
24 elemental maps of Fe (Fe K α).
25



26

27 **FIG. S4** EDXS elemental mapping of five XQGS-1 cells in the STEM-HAADF mode.
 28 (A) STEM-HAADF image with positions of five type-III (calcium carbonate granule)
 29 inclusions (yellow hollow circles). (B) - (F) EDXS elemental maps of (B) C ($C K\alpha$),
 30 (C) O ($O K\alpha$), (D) Fe ($Fe K\alpha$), (E) P ($P K\alpha$), and (F) Ca ($Ca K\alpha$). (G) RGB map with P
 31 (cyan), Ca (green), and Fe (red). (H) EDXS spectra for selected (~ 50 nm) regions of
 32 five type-III (calcium carbonate granule) inclusions in (A).

33



34

35 **FIG. S5** EDXS elemental mapping of five XQGS-1 cells in the STEM-HAADF mode.

36 (A) STEM-HAADF image with positions of ten type-II (calcium phosphate granule)

37 inclusions (red hollow circles) and five type-III (calcium carbonate granule)

38 inclusions (yellow hollow circles). (B) - (F) EDXS elemental maps of (B) C (C K α), (C) O (O K α),

39 (D) Fe (Fe K α), (E) P (P K α), and (F) Ca (Ca K α). (G) RGB map with P (cyan), Ca

40 (green), and Fe (red). (H) EDXS spectra for selected (~50 nm) regions of ten type-II

41 (calcium phosphate granule) inclusions and five type-III (calcium carbonate granule)

42 inclusions in (A).

43

44 **SUPPLEMENTAL TABLE**

45 Table S1. 16S rRNA sequences retrieved from Xingqingong Lake

46

Strain	No. of clones	Percentage of clones	Most similar strain	Accession	Identity	Reference
XQGS-1	22	73.3%	<i>Caenispirillum salinarum</i>	NR_117049	92.6%	(1)
<i>Magnetospirillum</i> sp.	6	20%	<i>Magnetospirillum</i> sp. clone WYH-24	JX537774	99.8%	(2)
<i>Methylobacillus</i> sp.	2	6.7%	<i>Methylobacillus</i> sp. clone CH1-43	JX079398	97.1%	Unpublished

47

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53 magnetism of magnetotactic bacteria in Lake Weiyang near Xi'an city. Quat Sci
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