

# Hydrogen sulphide producing microbes

## Marker Guide

### What this marker measures

The gut microbial community's capacity to produce hydrogen sulphide (H<sub>2</sub>S), a gas generated from the microbial metabolism of sulphur-containing compounds. At physiological levels, H<sub>2</sub>S may support colonic epithelial cell signalling and energy metabolism<sup>1</sup>; however, at excessive levels, it may compromise the mucus layer and gut barrier integrity.<sup>1-3</sup>

### Clinical associations

Consider this marker when your patient presents with:

#### Gut barrier or inflammatory concerns

Suspected increased intestinal permeability, mucus layer disruption, or chronic intestinal inflammation.

#### Clinical consideration

Also consider when low butyrate-producing potential co-occurs with high H<sub>2</sub>S-producing potential, as excess H<sub>2</sub>S may inhibit colonocyte butyrate oxidation and compound barrier stress<sup>4,5</sup>

#### Gas and bowel habit symptoms

Bloating, malodorous gas or diarrhoea-predominant

### Interpreting the result

All results are compared to Microba's healthy cohort to determine whether they fall within or outside the expected range.

LOW

#### Hydrogen sulphide-producing potential is lower than expected

This result does not suggest excess H<sub>2</sub>S production. No marker-specific intervention needed.

WITHIN RANGE

#### Hydrogen sulphide-producing potential is within expected parameters

Suggests physiological H<sub>2</sub>S levels may support epithelial signalling and mucosal homeostasis.

HIGH

#### Hydrogen sulphide-producing potential is higher than expected

May indicate increased potential mucus layer disruption, impaired colonocyte energy metabolism, and reduced gut barrier integrity. Action: see patient management insights

### Patient management insights

Reduce excess hydrogen sulphide-producing potential and support mucus layer and gut barrier integrity.

#### DIETARY STRATEGIES

- A diet rich in plant foods may reduce levels of sulphate- and taurine-reducing bacteria<sup>6,9</sup>
- Limiting excess intake of sulphur-rich animal proteins, particularly red and processed meats, may reduce microbial H<sub>2</sub>S production<sup>9,10</sup>

#### SUPPLEMENTATION PREBIOTICS

- GOS (galacto-oligosaccharides) supplementation may reduce levels of sulphate-reducing bacteria<sup>11</sup>
- Inulin supplementation may reduce levels of sulphate-reducing bacteria<sup>12,13</sup>



## Tips for patients discussion

Your report shows elevated levels of gut microbes that produce hydrogen sulphide, a gas with a 'rotten egg' smell. In excess, it can compromise the protective mucus layer and gut barrier. Gradually increasing tolerated fibre and diverse plant foods, while moderating sulphur-rich animal proteins like red and processed meats, can help.

## The community

Hydrogen sulphide is not produced by a single species, it's a community-level function. Below are some of the most common, though this list is not exhaustive.

<i>Clostridium saudiense</i>	<i>Blautia_A MIC9206</i>	<i>Gordonibacter urolithinfaciens</i>
<i>Flavonifractor plautii</i>	<i>Clostridium_M bolteae</i>	<i>Erysipelatoclostridium ramosum</i>
<i>Mailhella MIC8103</i>	<i>Romboutsia timonensis</i>	<i>Clostridium sp000435835</i>
<i>Desulfovibrio piger</i>	<i>Gordonibacter pamelaeeae</i>	<i>Mailhella sp003150275</i>
<i>UBA7182 MIC8275</i>	<i>Blautia_A MIC8343</i>	<i>Desulfovibrio fairfieldensis</i>
<i>Clostridium_M MIC9612</i>	<i>Blautia_A hydrogenotrophica</i>	<i>Desulfovibrio fairfieldensis</i>
<i>Turicibacter sanguinis</i>	<i>Blautia_A obeum</i>	<i>Turicibacter sp001543345</i>
<i>Bilophila wadsworthia</i>	<i>Lawsonibacter sp000177015</i>	

## How results are calculated

All microbiome marker results are compared against the Microba Healthy Cohort – a purpose-built group of more than 450 healthy individuals, with samples collected and analysed using the same workflow as patient samples.

Each marker is scored by comparing the patient's relative abundance against the cohort average. The distance from this average is expressed as standard deviations, and determines whether a result is classified as Low, Borderline, or High.

### How the result scale works



The patient's relative abundance is compared to the Healthy Cohort average. A **negative** distance from average means the microbial group is less abundant than the Healthy Cohort. A **positive** distance means it is more abundant. Results falling outside the expected range are classified as borderline or high/low (borderline high/low: +/-0.68, and high/low: +/-1.28).

### GRADE DESCRIPTION

A	Body of evidence can be trusted to guide practice
B	Body of evidence can be trusted to guide practice in most situations
C	Body of evidence provides some support for recommendation, but care should be taken in its application
D	Body of evidence is weak, and recommendation must be applied with caution
PP H	Body of evidence is observational only and must be applied with caution
PP IV	Body of evidence is in vitro and must be applied with a high degree of caution

## Evidence grading for patient management insights

The letter grades shown next to each patient management insight show the quality of the research behind it. Every insight provided has been through a rigorous review of the scientific literature and graded using the NHMRC Levels of Evidence, so you can see exactly how strong the evidence is before applying it in practice.