The Compound: MCB3681

MCB3681, the active substance of prodrug MCB3837, is being developed as an intravenous (iv.) treatment of *Clostridium difficile* infections (CDI) for which currently no approved iv. treatment option exists. It is a small molecule antibacterial of a novel class with structural elements of an oxazolidinone and a quinolone. MCB3681 affects four different targets resulting in superior antimicrobial activity, exceptionally low propensity for resistance, and lack of cross-resistance to any established class of antibacterials while having an ecologically favorable impact on the human microbiota.

Lead Indication: iv. Treatment of CDI

In 2013 *C. difficile* was assigned a threat level of urgent by the U.S. CDC. Incidence of hospitalized patients with CDI is estimated to reach one million in the U.S. and EU by 2021. More than 40% of hospitalized *C. difficile* patients are diagnosed with severe/severe-complicated CDI (Fig. S), half of which receive off-label iv. drugs as there is no approved iv. treatment available. This results in a high unmet medical need for an iv. treatment, and MCB3681 is currently the only antibacterial in clinical development for iv. treatment of CDI (Table 1).

### Proof of Principle in Phase I

**Reduction of fecal Gram-positives while sparing Gram-negatives**

In a phase I b study at Karolinska Institute, an antibacterial effect on Gram-positive species in feces (Fig. 1) was demonstrated in 12 healthy subjects without affecting aerobic and anaerobic Gram-negative species incl. Bacteroides (Fig. 2) in the intestine, known to provide colonization resistance in the gut.

**High fecal concentrations of MCB3681**

Fecal concentrations of MCB3681 in 12 healthy subjects ranged from 99 to 226 mg/kg feces (Fig. 3).

**Strong activity against *C. difficile* strains**

MCB3681 has shown strong in-vitro activity against 114 clinical isolates of *C. difficile* (Fig. 4) showing superior activity compared to vancomycin, metronizadole, fidaxomicin, and other comparators.

### Safety Profile

Safety and tolerability of MCB3837 (prodrug of MCB3681) have been demonstrated in almost 100 healthy volunteers in three phase I studies including a multiple dose phase I b study with daily infusions of 6 mg/kg MCB3837 for 5 days.

### Next Steps

Based on the proof of principle and a superior in-vitro activity compared to existing CDI treatments as well as a favorable clinical safety profile, Morphochem is currently planning Phase II/III clinical development for iv. treatment of CDI.

### Company Profile

Morphochem AG is a privately held company located in Munich, Germany; it is a 100% subsidiary of Biovertis AG, Austria, backed by TVM Capital. Its mission is to develop and commercialize a novel class antibacterial to treat serious *C. difficile* infections that pose an urgent threat to public health. (Contact: thomas.kapsner@biovertis.de)