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Session:

“Shaping the Future of Personalized Nutrition: Evidence–Driven Science Meets Real–World Impact.”

Title: **Digestibility Matters: When Models Drive Mineral Conclusions**

Bioavailability is a cornerstone of nutrition and biomedical research, shaping scientific conclusions, clinical recommendations, and consumer decisions. Yet the experimental tools most commonly used to study it - *in vitro* digestion models - were largely developed for complex food matrices.

When dietary supplements are evaluated as if they were food, or as if they were consumed under fasted conditions, it should not be surprising when the results fail to reflect physiological reality.

This talk addresses a key methodological blind spot: mineral supplements occupy a distinct digestive context, yet they are routinely assessed using models designed for entirely different scenarios. Such inherited assumptions may shape conclusions more than the minerals themselves.

Using magnesium supplements as a focused case study, I will present a digestion-oriented *in vitro* framework designed specifically for supplement use. The approach couples the evaluation of luminal bioaccessibility with an assessment of passive transport potential - together capturing the essential prerequisites for the predominantly passive absorption pathways that govern magnesium uptake under typical intake conditions.

The findings demonstrate that digestion model design, particularly underlying assumptions about physiological context, can profoundly influence how mineral performance is interpreted. Beyond magnesium, this work highlights a broader need to rethink how bioavailability is modeled in the supplement space, and to ask whether the tools we rely on are fit for the questions we ask.