

Veterinary Microbiome Forum — Launch Session

Summary of Lectures and Panel Discussion

August 30, 2026 · BEXCO, Busan · Special Session of the 9th Busan Veterinary Conference (BVC 2026)



Lecture 1 — The Microbiome in Veterinary Medicine: Importance and Application

Prof. Hwa-Young Youn (Professor Emeritus, College of Veterinary Medicine, Seoul National University)

Prof. Youn traced his interest in the microbiome to clinical experience with digestive cases that could not be resolved with medication alone. He described a paradigm shift in the treatment of enteritis: where antibiotics were once central, the focus has moved to restoring the gut microbiota, with growing use of probiotics and the introduction of objective disease indices for chronic enteropathy. Microbiome modulation is becoming relevant even in refractory conditions such as parvoviral enteritis.



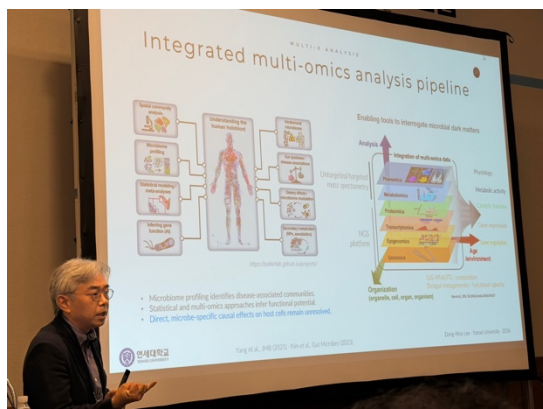
He highlighted the gut–brain–skin axis, citing 2025 research linking canine anxiety, insomnia, and atopic dermatitis to gut microbes, and emphasized that roughly 70% of the body's immune cells reside in the gut, making gut immunity a central determinant of health. As companion animals live longer, the antioxidant activity of gut microbes also matters for suppressing aging-related chronic disease.

He organized microbiome therapeutics into four complementary approaches — prebiotics (fibers such as inulin and pectin that yield short-chain fatty acids), probiotics (live beneficial organisms whose effects are species- and strain-dependent), postbiotics (inactivated cells and metabolites, actively commercialized for applications including brain disease and atopy), and fecal microbiota transplantation (restoring the ecosystem itself). These should be combined to fit the individual patient (e.g., synbiotics), and species-specific strains — canine-derived for dogs, feline-derived for cats — are preferred. As his core framework he presented the "Microbiome Factory" concept: bioactive metabolites produced by the gut microbiome keep vascular and lymphatic systems healthy, supporting oxygen and nutrient delivery, immune-cell trafficking, and organ homeostasis, ultimately promoting healthy longevity, with immune modulation as the key element.

Noting that many marketed probiotic products lack scientific verification, he framed the Forum's mission as gathering voices from the field, accumulating evidence-based data, establishing species-specific guidelines, and making individualized nutritional prescription a standard — with the ambition of positioning Korean veterinary medicine as a global leader in the field.

Lecture 2 — Next-Generation Human Microbiome Research: Multi-omics and Precision Medicine

Prof. Dong-Woo Lee (Department of Biotechnology, Yonsei University)



Prof. Lee reviewed how NGS technology opened the genomic era roughly 25 years ago, and argued that the shift in disease patterns over the past 70 years — from infectious to metabolic and immune disease — reflects changes in environment and symbiotic microbes rather than in human genes. He introduced the holobiont concept: the human should be viewed not as a single organism but as an ecosystem coexisting with its microbes, a premise that underpins precision medicine.

An individual's unique microbiome is a key factor explaining differential responses to the same drug.

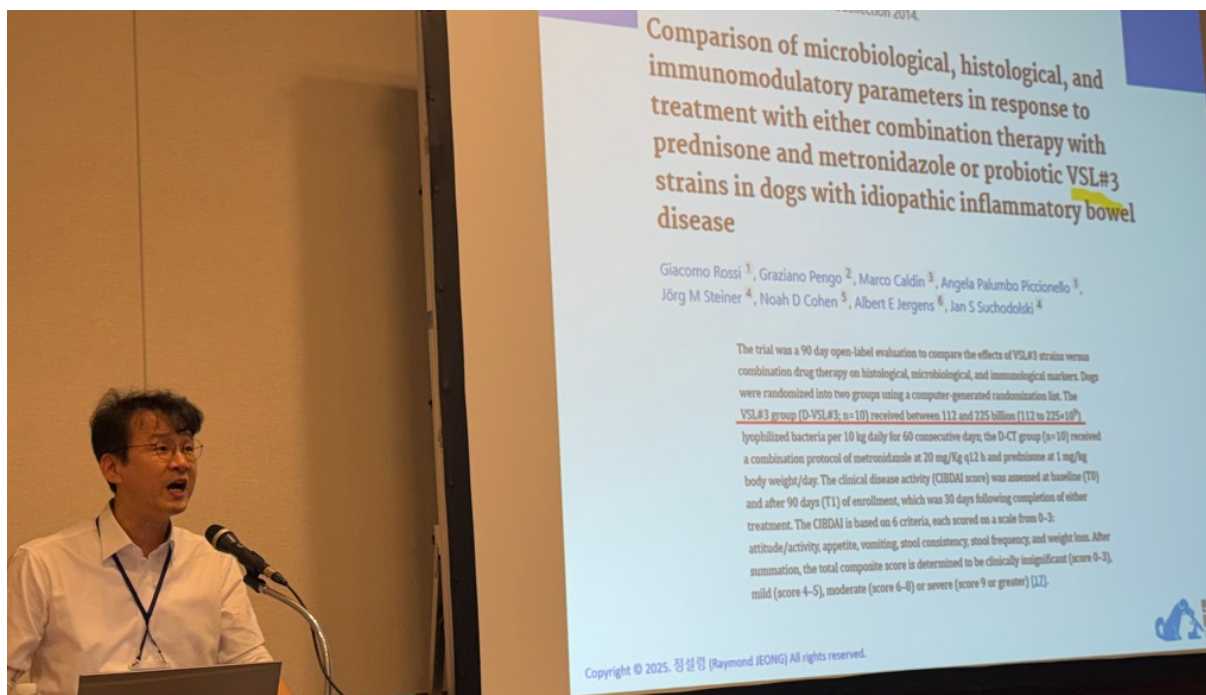
The microbiome assembles within about three years of birth from maternally transmitted microbes, shaped by diet and environment. Diet exerts rapid effects — as little as four days of dietary change can substantially remodel the gut community ("you are what you eat") — and the ecosystems of primitive tribes and modern city dwellers differ markedly.

He assessed the Human Microbiome Project (launched 2006, ~\$180M): phase 1 established reference microbiomes of healthy individuals and revealed site-specific ecosystems; phase 2 compared disease cohorts and documented dysbiosis in inflammatory bowel disease; but the project closed without identifying specific causative organisms or mechanisms. In moderate-to-severe or treatment-refractory ulcerative colitis, clinical remission rates with conventional and even newer targeted therapies generally remain in the 20–45% range, which is why FMT (clinical remission ~30–40%, up to ~60% in some studies) is

drawing attention. In a collaboration with Severance Hospital, his group followed 28 UC patients for six months after FMT and concluded that healthy individuals and patients differ not in the presence or absence of particular microbes but in the structure of the microbial ecological network itself — a functional deficiency of the networks formed among organisms. He proposed that new biomarkers and therapeutic targets will require integrated analysis of whole-ecosystem function through multi-omics data (genome, transcriptome, proteome, metabolome) combined with AI.

Lecture 3 — Understanding the Companion Animal Microbiome

Seol-Ryung Chung (CEO, Korea Pet Nutrition Institute)



CEO Chung grounded the audience in fundamentals: microbial cells in the body (~38 trillion) outnumber host cells (~30 trillion, 80–90% of which are red blood cells); the large intestine harbors the densest community in companion animals as in humans; and 99% of gut microbes belong to only five phyla. She stressed that scientific evidence is established at the strain level — species-level labeling is insufficient to support efficacy claims, whereas a clearly specified strain usually indicates documented changes in defined endpoints.

Reviewing the probiotic literature, she observed that most studies remain at the level of surrogate indicators (fecal quality, reduction of harmful bacteria, immune markers). Individual studies are weak, but the consistency of direction — nearly all showing improvement — supports cautious optimism about future clinical benefit. She warned against over-reading the Shannon diversity index, which counts pathogens toward diversity, and noted the trend toward combining it with tools such as the Dysbiosis Index. In dogs, *Clostridium hiranonis* is pivotal for converting primary to secondary bile acids. She discussed a canine IBD study in which VSL#3 alone achieved clinical and histological improvement comparable to steroid-plus-metronidazole therapy — while flagging its contested points (small n, metronidazole effects) — and studies showing increased tight-junction protein expression. Feline studies

show a weaker, more indicator-level pattern, underscoring species differences.

Applying the ultra-processed food (UPF) framework to pet food, she noted that most kibble meets the UPF definition; this is not an indictment of pet food, which offers convenience, economy, and nutritional balance, but processing does destroy functional nutrients, which argues for supplementation and dietary diversity — studies associate kibble-only feeding with higher rates of cancer, chronic enteritis, and atopy, and early dietary variety with lower atopy incidence. Finally she raised quality and safety concerns: in one analysis of 25 commercial probiotic products, only two matched their labeled content, and antibiotic-resistance genes are sometimes detected in products — meaning "antibiotic-robust probiotics" are not necessarily a virtue.

Lecture 4 — Beyond Dysbiosis: Microbial Fermentation in Dogs and Cats

Randy Ringold, PhD (Founder & CTO, VDI Laboratory, USA)



Dr. Ringold, a clinical chemist (developer of the NT-proBNP test later sold to IDEXX), opened with the premise that every animal carries a unique "bacterial village": expecting a rural dog and a New York City dog to share a microbiome is unreasonable, and fitting all animals to an idealized average has limited value. The microbiome directly reflects diet and environment — soil organisms in dogs that eat dirt, rodent organisms in hunting cats — and environmental toxins (herbicides, pesticides, heavy metals) directly perturb it. Because normal ranges for gut organisms can vary 10- to 100-fold, simple high–low calls are a poor basis for clinical decisions.

His central framework was fermentation balance: what the microbiome does matters as much as who is there. Saccharolytic fermentation of fiber yields beneficial short-chain fatty acids; proteolytic fermentation is normal but, when excessive, produces branched-chain fatty acids, ammonia, and indoles. Health corresponds to saccharolytic dominance with proteolytic fermentation kept in check. Cancer-associated dysbiosis often shows the reverse pattern, chemotherapy itself can act as a toxin inducing dysbiosis, and pre-treatment gut status correlates with survival and with response to immune checkpoint inhibitors.

Citing the ACVIM consensus report, he noted that IBD is now framed as an ecosystem disease and metabolic dysbiosis, with diet as the first line of defense, fiber as the key tool, and probiotics as adjuncts. He strongly endorsed FMT as a "super-probiotic" that transplants an entire ecosystem.^{upc}

He introduced VDI's methodology: shotgun metagenomics covering bacteria, fungi, yeast, parasites, and antibiotic-resistance genes; a "gut macroeconomics" approach that evaluates the whole ecosystem across commensal, opportunistic, pathogenic, and fungal categories; a Fermentation Quality Index (FQI) summarizing fermentation balance (adjusted for the carnivorous physiology of cats); and a Dysbiosis Severity Index that achieved an ROC AUC of 0.845 in 687 dogs for separating animals with and without GI signs, feeding an evidence-based model that recommends concrete actions (probiotics, FMT, diet change, antibiotics).

Three cases illustrated his refrain that diet comes first ("if you are not going to control the diet, don't even think about probiotics or FMT"): a bulldog on a year of metronidazole and probiotics whose microbiome was 77% probiotic strains with a very low FQI (treated by stopping probiotics, changing diet, and FMT to restore diversity); a 12-year-old Sheltie with lethargy and vomiting in whom sequencing revealed the acid-resistant gastric pathogen *Sarcina* (*Clostridium*) *ventriculi*; and a raw-fed Bernedoodle with acute diarrhea showing 9% yeast (normal <2%), 29% *Clostridium* *perfringens*, and 9% *Cyniclomyces* *guttulatus* traced to rabbit droppings — the veterinarian, he argued, must act as a detective identifying the contamination source, since treatment without source removal is only temporary.

Panel Discussion

Panelists: Hwa-Young Youn, Dong-Woo Lee, Seol-Ryung Chung, Randy Ringold, Hyun-Wook Kim (President, KBVP)



Heavy metals, environment, and immunity

Asked about mercury exposure from fish-based raw diets, Dr. Ringold explained that heavy metals impair protein synthesis and microbial replication, acting selectively on sensitive organisms and thereby reshaping the community — with beneficial bacteria unfortunately tending to be the more sensitive. A panelist added air pollution to the list of environmental factors that can degrade the gut environment systemically. Another panelist pressed the causal question — does a broken microbiome cause disease, or does the gut immune network change first and the microbes follow? — noting that 70% of immunity resides in the gut and that recent Crohn's disease research identifying specific T-lymphocyte mutations shows why the underlying immunological cause matters.

Diagnostic indices: comparison and integration

Asked to compare VDI's approach with the Texas A&M Dysbiosis Index built on a small panel of taxa, Dr. Ringold argued that heavy reliance on the presence of a few strains fails to answer the clinical question of what to do next — "a test that cannot change patient treatment is just a waste of money" — whereas whole-ecosystem functional assessment is designed to yield a treatment direction. Panelists noted that the current DI represents only 20–30% of gut bacteria and that the Shannon Index counts pathogens toward diversity; CEO Chung proposed integrating multiple indices (DI, Shannon, FQI and metabolite-based measures) for a comprehensive ecosystem assessment. The discussion converged on a broader shift from taxonomy ("who is there") to function ("what they do"), with metabolites emerging as biomarkers.

Raw food safety and the role of fungi

On raw-diet risk, Dr. Ringold distinguished the food itself from unwanted contamination introduced during processing and storage, noting that many raw-fed animals in the US maintain healthy gut environments; an attendee countered that how people handle food matters more than the food category. Dr. Ringold also shared the observation that animals on fresh or raw diets often exceed the <2% fungal reference while remaining very healthy, suggesting the bacteria-centric view should expand to the role of gut fungi. On a question linking fecal fungal overgrowth to mitochondrial function, unpublished data were cited showing that when specific suppressive organisms disappear and fungi surge, impaired energy metabolism, reduced mitochondrial efficiency, and barrier breakdown are indeed observed.

Preventive application and methodology

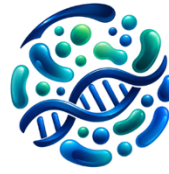
Asked whether microbiome analysis could serve preventive medicine before markers such as NT-proBNP or SDMA rise, Dr. Ringold agreed: disease is the outcome of chronic pressures — diet, toxins, lifestyle — and asymptomatic dogs are already being analyzed for diet optimization and toxin identification; identifying and relieving those chronic pressures is the essence of prevention. On methodology, the view was offered that NGS holds the advantage over qPCR for preventive profiling because it captures overall diversity.

Launch Ceremony and Road Map

Following the panel, the Forum was formally launched. Plaques of appreciation were presented to the visiting lecturers, and congratulatory remarks were delivered by President Sang-hoon Lee of the Busan Veterinary Medical Association (read by proxy) and, by video, by founding President Prof. Sung-Bum Cho of Seoul National University, who framed the Forum as an open academic platform connecting basic research and clinical practice — with the microbiome as a bridge at the heart of the One Health era. Prof. Jörg Steiner of the Texas A&M Gastrointestinal Laboratory also sent a video message of congratulations.

The Forum will be led by President Sung-Bum Cho, Vice President Jae-Hyun Lim (Daegu Animal Medical Center), and Secretary General Prof. Jong-Hwan Park (Chonnam National University), with three divisions planned: Basic Research, Clinical, and One Health. Regular academic meetings are planned each spring and autumn, with the first scheduled for around March 2027 in the Seoul/Gyeonggi area; a vision-sharing workshop is planned for December 2026; and a joint research and case network will link research and practice. An international network with partners in the US and Japan is envisioned, beginning with Prof. Steiner's upcoming visit to Korea (September 18-21, October, November 16-18). Official website:

www.vmf.kr.



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