

The Scientific day of the 62nd annual meeting of the European section of the ICD was held at the Royal Society on Friday 16th June 2017

The theme for the day was “Life, microbiology, interactions, periodontal disease and its ramifications”

The delegates were welcomed by our President Shelagh Farrell who gave some history of the Royal society and the building in Carlton Terrace.

The programme was chaired by Peter Floyd who gave a short introduction on “Changing Perspectives” to reinforce the concept of dentistry as a biological discipline.

We had two speakers for the session which ran from nine o'clock until noon, to allow time for the Forum to follow before the lunch break.

The programme was opened and completed by Craig Gershater who is Consultant in Bioprocess science at Synthace Ltd He spoke on “The microbial world - an exploration of biological communication” in his first presentation. His presentation began with an explanation of “Applied Microbiology”. He then moved on to “The multifactorial paradigm” and postulated that the use of small bioreactors would help to gain an understanding of “The oral ecosystem”

He gave a wide-ranging overview of his work with explanations as to why the ‘one factor at a time’ experimental design is no longer sufficient, hence the progression to multifactorial designs. It became apparent that these complicated experimental models took longer to set up than the experiments did to run!

A biofilm is a 3- dimensional community, within which are multiple levels of cell to cell interaction. He completed his first presentation by introducing the concept of synthetic biology - to create and engineer microbial strains in order to understand, influence and exploit cell to cell interactions.

In his second presentation, he introduced the concept of the fourth industrial revolution.

His argument was that the first revolution, in about 1780-90 involved water, steam and mechanical production equipment.

The second, circa 1870 involved electricity, the division of labour and mass production.

The third, circa 1980 involved electronics, automated production and information technology.

The fourth, which is upon us, will involve cyber- physical systems, which are under development and who knows where that will take us?

He explained that we are beginning to see a shift towards “complex” away from “complicated” systems and illustrated this by the shift in microbial system studying, from “genome” to “metabiome” to “interactome”.

He explained that, as well as entering the world of “omics”, we are drowning in data. “Big Data”, to coin a phrase, and that biologically based numerical engines may be a way forward in coping with this enormous data load, using hybrid semiparametric, Bayesian statically models.

After two mind expanding presentations, at least to this Periodontist, it was a relief to return to more familiar ground.

Iain Chapple, Professor of Periodontology and Dean at Birmingham, spoke before and after the coffee break. His first talk was on “The response of the body to commensal organisms, invaders and associated biofilm imbalances”

The human, as an individual, comprises mammalian and microbial cells, the relative proportions of which have been estimated from time to time. Currently, he reported that the ratio is likely to be about 2:1 in favour of the microbes – reducing after defecation! This produced some, perhaps uncomfortable laughter, as the delegates absorbed the implications of their “new” identity!

He explained that the simple experiment of “experimental gingivitis”, with which we are all familiar, was correct and reproducible. Gingivitis did not however, automatically progress to periodontitis, but was a necessary precursor.

An elegant disquisition followed on the various hypotheses of disease causation ending with the current view of an imbalance between the (commensal) plaque and a disproportional host reaction, or “dysbiosis” to allow disease initiation and progression.

The role of Polymorphs (PMN's) in the process of tissue destruction was as highlighted and we were introduced to the concept of Lipoxins, which can "damp down" the inflammatory response.

After the coffee break, Iain's second talk was entitled

"Time to put the mouth back into the body"

The Truth about Perio – Systemic links.

He focused on CNCDs - chronic non-communicable diseases, of which the two best known are diabetes and atherosclerosis / heart disease, but severe periodontal disease – the 6th most common human disease – also falls into this category.

He examined epidemiological associations and the biological plausibility of a causative relation between severe periodontal disease and other CNCDs

Periodontal bacteria enter circulation after eating and oral hygiene procedures.

Bacteraemia induces an acute phase response in the Liver. There is an increase in CRP which in turn can lead to an increase in systemic inflammation

Data from the USA and Europe reveals an increase in the proportion of the population exhibiting obesity and suffering from type 2 diabetes.

Severe periodontal disease has been linked to an altered ratio of HDL/LDL and the severity of periodontal disease linked to an increase in diabetic complications.

Iain was able to show some absolutely stunning videos during this lecture, depicting the behaviour of white blood cells intra- and extra vascular, to illustrate the biological plausibility of his proposals.

The session was concluded by a lively discussion before giving way to the Forum.

Thank you to all who contributed to a most informative session,

Peter Floyd, Session Chairman and Vice Regent UK.