SHAPING THE FUTURE OF DENTAL EDUCATION:

THE IMPACT OF NEW TECHNOLOGICAL AND SCIENTIFIC DISCOVERIES ON TRADITIONAL DENTAL EDUCATION

Scientific and Research Technologies
Prof Abigail Tucker

COLGATE

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SCIENTIFIC AND RESEARCH TECHNOLOGIES

- What might the dentist of the future need to know?
- How can we bring new scientific discoveries and research into the curriculum?
- How do we choose which advances to teach?

WHAT NEW ADVANCES ARE OUT THERE?

- New generation sequencing: paving the way for personalised dentistry
- The microbiome: understanding interactions with our microbiome for early diagnosis
- New materials: biomaterials to aid regeneration
- New imaging techniques: early diagnosis
- CAD/CAM: 3D printing teeth and devices

ARE BIONIC TEETH THE FUTURE?

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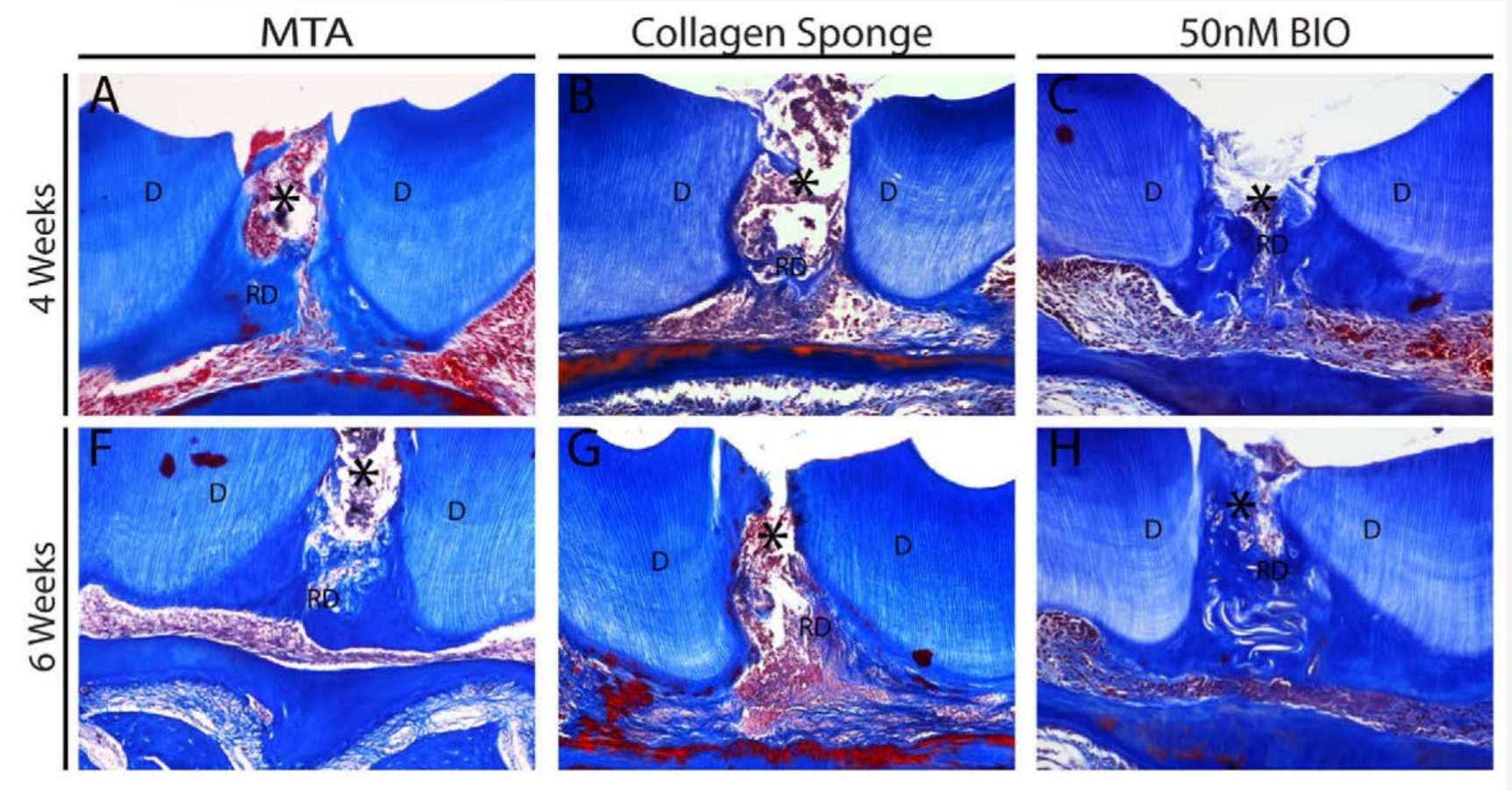
Pacey, BDJ, 2014

SOME LOCAL EXAMPLES

- Enhancing the tooth's innate ability to repair (bioactive materials)
- Enhancing re-mineralisation (nanotechnology)
- New ways to detect caries (novel imaging tools)

PROMOTION OF NATURAL TOOTH REPAIR



Stimulation of pulp stem cells by Wnt signalling
Neves et al., 2017 Scientific reports

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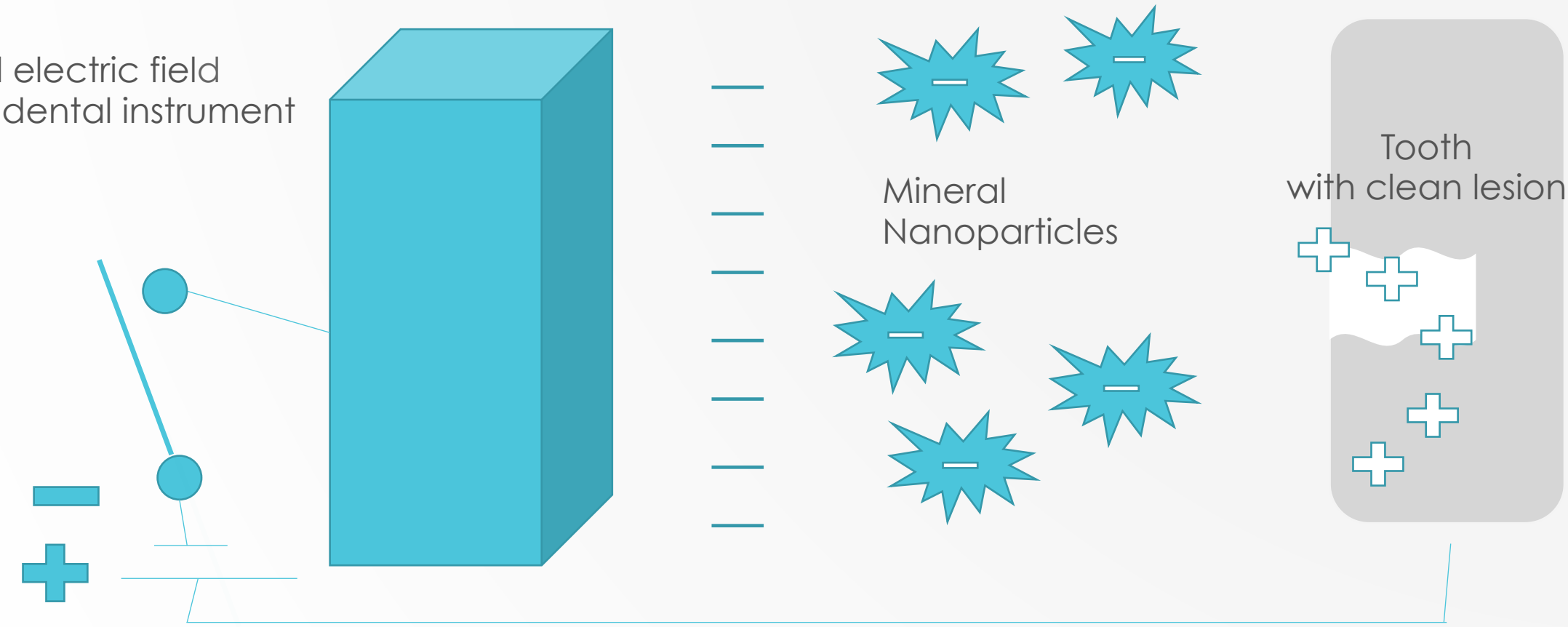
Paul Sharpe

ENHANCING MINERALISATION

EAER (Electrically Accelerated & Enhanced Remineralisation)



NirVisio Deep insights for dentistry

Caries Detection by Near-Infra Red Imaging

- Using safe, near-Infra red, 3D imaging to help Dentists better assess, preventively manage & monitor dental caries.
- A hand-held image capture device which acquires 3D images of individual teeth, displays the images on monitors (in a similar way to radiographic images) and can be linked to standard dental practice software systems.

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Nigel Pitts

ARE MODERN DENTISTS TAKING ADVANTAGE OF NEW RESEARCH?

- Don't Know, Can't Do, Won't Change: Innes et al., 2016, JDR
- Move towards minimally invasive dentistry
- Invasive operative management of enamel lesions is not supported by evidence from current research but despite this 40-80% of dentists worldwide still chose a drill over managing them preventatively or micro invasively.
- Need to create a workforce that is more willing to change, more willing to ask questions about procedures, and to want to learn about new research

INVOLVING RESEARCH IN THE CURRICULUM

- Making sure students know how to obtain information about the latest scientific research and are able to interpret the literature
- Making sure students question where the information they are being told comes from: what is the evidence (forming critical thinkers)
- Making sure students appreciate how dentistry progresses and how new research/innovation will impact on their life as a dentist

LOCAL EXAMPLES: 1

- Year 2 BDS students have to write a 5,000 word student selected topic on an area of dental/oral research.
- Trained in how to use databases to search for research papers
- Trained in using endnote to collate references
- Trained in how to read scientific papers
- Time provided to focus on topic over an extended period (6 months)
- Partnered with a staff member who is an expert in research in the subject area for one to one discussion
- Gold star certificates presented to best projects
- Opportunities to apply for ABSTD (associated of basic science teachers in dentistry) oral bioscience essay competition

Isabelle Miletich

LOCAL EXAMPLES: 2

- Teaching the evidence behind the information taught
- For example, providing tutorials/lectures on animal studies and clinical trials to understand how pieces of information have been generated and integrated into practice
- Testing knowledge but also the basis behind the knowledge throughout the course
- For examples in an essay question, asking not only about a procedure, but what research was performed to create/test/ analyse that procedure

LOCAL EXAMPLES: 3

- Being exposed to New Technologies during studies
- For example using Haptics (HapTEL virtual dental simulator)
- Trying out 3D printing

Margaret Cox
Barry Quinn
Rupert Austin

LOCAL EXAMPLES: 4

- Exposing students to research
- Summer studentships for dental students to take part in research funded by King's College London.
- Dental students can chose from over 150 projects on a diverse array of research topics to spend 4-8 weeks over the summer
- Opportunity to apply for King's Experience Research Award

HOW TO DECIDE WHAT NEW RESEARCH TO TEACH

- Which of the many new technologies/research areas should we teach to our students?
- Should there be guidelines about how to choose?
- Are some technologies more promising than others?
- What is the best way to integrate research and new technology into the curriculum

These are some of the areas we would like to tackle in today's workshop