International Poster Journal IPJ of Dentistry and Oral Medicine

Int Poster J Dent Oral Med 2001, Vol 3 No 2, Poster 80

Influence of Serum Dental Alloy Eluates on Primary Human CD8±Lymphocyte-Migration

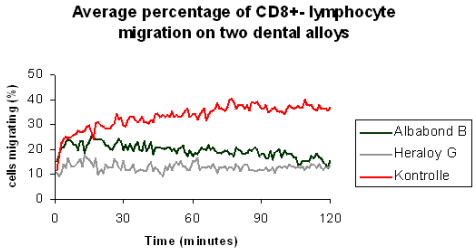
Language: English

Author(s): Georg Gassmann[1], Frank Entschladen[2], Kurt S. Zänker[2], Wolf-Dieter Grimm[1]
[1]University of Witten/Herdecke, Department of Periodontology, Germany
[2]University of Witten/Herdecke, Institute of Immunology, Germany

Date/Event/Venue:
17th.- 20th September 2000
86th Meeting of the American Academy of Periodontology in Conjunction with the Japanese Society of Periodontology
Honolulu, Hawaii

Introduction

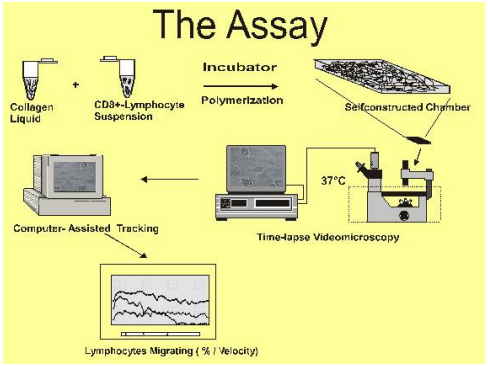
Introduction and aims: Locomotion of T lymphocytes within three-dimensional collagen matrices is regulated via different signaling states of the cells. Purified human Cd8+ T cells developed a spontaneously locomoting subpopulation of about 25% of the whole population immediatly after incorporation into a three-dimensional collagen matrix analyzed by time-lapse videomicroscopy. Furthermore, confocal microscopy analysis of phosphortyrosine residues, focal adhesin kinase (FAK), and protein kinase C (PKC) revealed an exclusive cellular distribution of these components, suggesting a regulation of T lymphocyte locomotion different from migration models developed for other cell types (Enschladen et al. 1997).

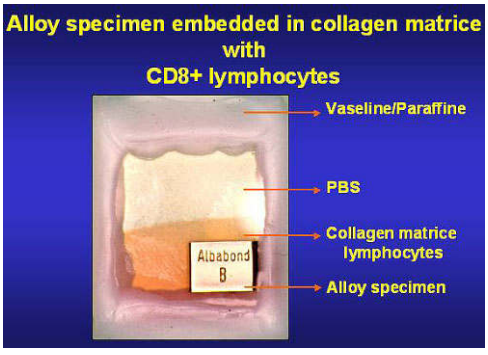


Objective

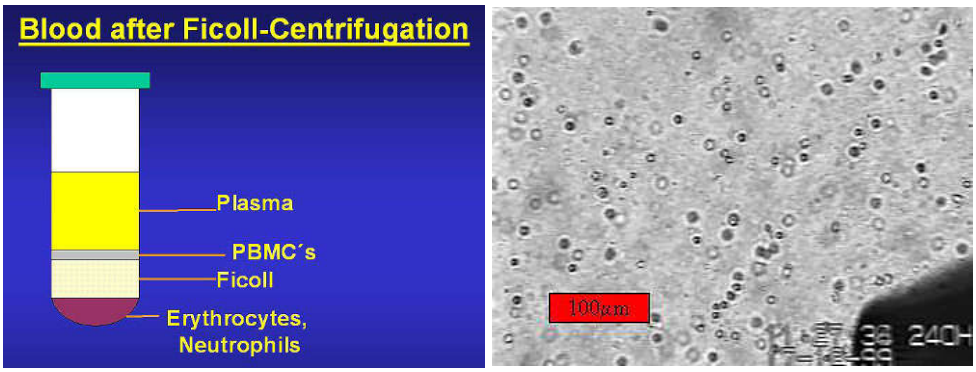
In how far is CD8+ lymphocyte Migration affected by the eluates of dental alloys?

Material and Methods



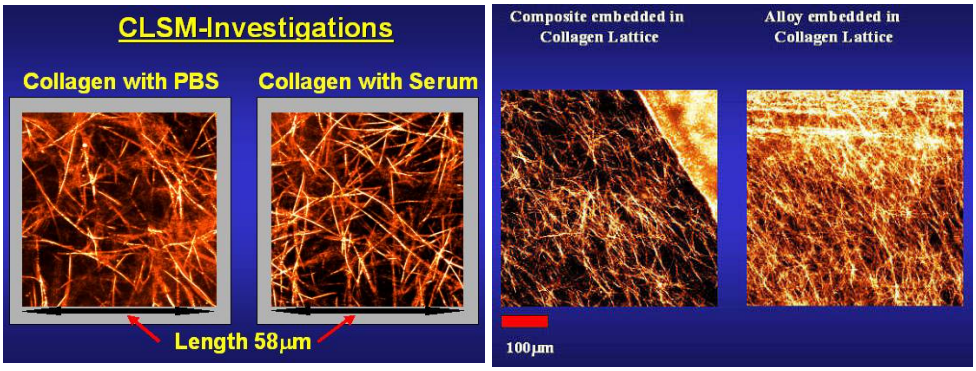


The mononuclear cell fraction was isolated from heparinized blood of healthy donors by density-gradient centrifugation using Ficoll-Hypaque. CD8+ cells were positively selected using immunomagnetic beads coated with mouse anti-human Cd8 mAb (ITI-5C2)for 10 min.at 4°. Subsequently, cell-bound beads were detached using polyclonal anti-mouse Fab Abs for 45 min. at 20°. Purified viable CD8+ cells were selected by flow cytometry. Isolated cells were maintened overnight in RPMI supplement with 2 mM L-glutamine, 10% heat-inactivated FCS, penicillin and streptomycin. No additional stimulus was added.

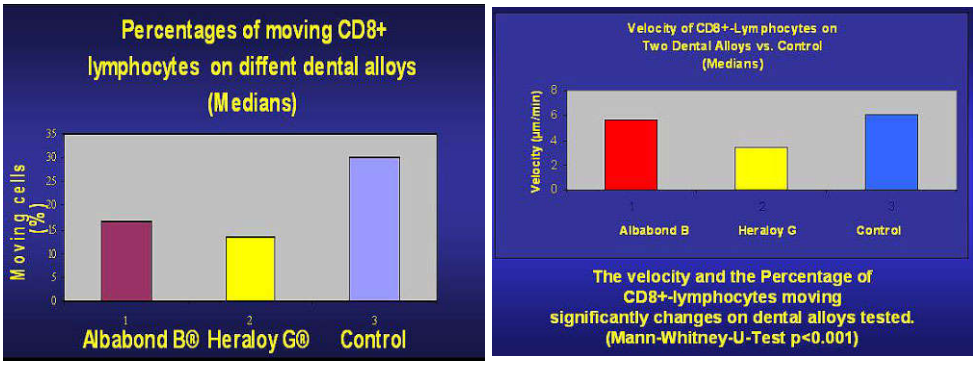


Time-lapse videomicroscopy and computer-assisted cell tracking:
T cell locomotion within 3D collagen lattices was recorded by time-lapse video-microscopy.

Confocal Laser-Scanning Microscopy (CLSM):
Three-channel confocal microscopy was performed using an inverted confocal laser-scanning microscope (Leica TCS 4D, Bensheim, Germany).Interaction between the surrounding 3D collagen matrix and the specimens were visualized by confocal reflection in combination with the transmission image. Dual-color immunofluorescence has been performed.



Results



- Spontanous CD8+ lymphocyte migration is reduced on the dental alloys tested.
- The reducement is different on different alloys.
- CD8+ lymphocyte migration could be a biofunctional parameter for testing biocompatibility.
- Further studies are needed to evaluate the influence of dental alloys on the signal transmitting pathways (PTK/PKC) in CD8+ lymphocytes.

Discussion and Conclusions

- Using a highly sensitive continuous time cell-tracking approach, spontanuous T cell migration in 3D collagen lattices was challenged by serum eluates of dental alloys (non precious and precious alloys).
- Reducement of cell migration was higher in precious alloy eluates than in non precious alloy eluates.
- CD8+ lymphocyte migration could be a biofunctional parameter for testing biocompatibility.
- Further studies are needed to evaluate the influence of dental alloys on the signal transducing pathways within CD8+ lymphocyte migration.

Bibliography

1. Entschladen, F., Niggemann, B., Zänker, K.S., Friedl, P. :Differential Requirement of ProteinTyrosine Kinases and Protein Kinase C in the Regulation of T Cell Locomotion in 3D Collagen Matrices.J. Immunol. 159: 3203-3210; 1997

2. Friedl, P., Entschladen, F., Conrad, C., Niggemann, B., Zänker, K.S. :CD4± lymphocytes migrating in three-dimensional collagen lattices lack focal adhesions and utilize beta 1 integrin-independent strategies for polarization, interaction with collagen fibres and locomotion.Eur. J. Immunol. 28 (8): 2331-43; 1998

This Poster was submitted on 28.05.01 by Dr. Georg Gassmann.

Correspondence address:
Dr. Georg Gassmann
Universität Witten/Herdecke
ZMK
Department of Periodontology
Alfred-Herrhausen-Straße 50
58448 Witten
Germany

Poster Faksimile: