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A novel model of atherosclerosis in mice

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Porphyromonas gingivalis have been found in atherosclerotic lesions in humans. We developed a murine model of atherosclerosis using a 60% fat diet and gavage of PCB-77 and/or *P. gingivalis*. The model was assessed by histological examination of the aortic sinus, and ELISA assays for biomarkers of damage to the endothelial glycocalyx. C57/BL6 mice were raised from six weeks on either regular diet or a 60% fat diet. PCB-77 and/or *P. gingivalis* (ATCC 33277) suspensions were administered by oral gavage and mice sacrificed on days 10, 15 or 20. Frozen sections were cut through the aortic valve and analyzed for the presence and size of plaques, amount of fibrous tissue and inflammation. ELISA test kits measured thrombin-anti-thrombin complex, anti-thrombin III, total plasminogen activation inhibitor-1, syndecan 1, heparan sulfate and hyaluronan synthase 1. Animals receiving one PCB-77 gavage and one bacterial gavage demonstrated a low level of fibrous tissue and fat staining with a moderate level of inflammation. Fat staining was observed in foam cells in the artery walls of two sections in the aortic sinus with cholesterol inclusions. Most mice receiving three gavages of PCB-77 showed a moderate level of fat staining with low inflammation. Significantly higher levels of PAI-1 in mice were receiving one PCB-77 gavage and one bacterial gavage than in the control group. Levels of heparan sulfate detected in mice receiving three gavages of PCB-77 were significantly higher than in the control group. The levels of syndecan 1 and hyaluronan synthase 1 in the mice receiving three gavages of PCB-77 were significantly higher than in controls. The data show that administration of PCB and *P. gingivalis* to mice fed a high fat diet resulted in pathological features and biomarker abnormalities indicative of the presence of cardiovascular disease.

Biography

Paul H Wooley is the Chief Scientific Officer at Kardiatonos Inc., USA. He completed his PhD in Immuno-genetics at Guys Hospital Medical School. He was a Mayo Clinic Fellow and a Professor at Wayne State University, Wichita State University and KU Medical School, USA.

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