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## Congo Red-binding Protein in Rough-phenotype Aggregatibacter actinomycetemcomitans is Amyloid-like Fiber

<u>Ryuta Kimizuka<sup>1)2)</sup>, Tetsuo Kato<sup>1)2)</sup>, Sadamitsu Hashimoto<sup>2)3)</sup>, Ayumi Yamanaka-Okada<sup>1)</sup>, Katsuji Okuda<sup>1)</sup> and Kazuyuki Ishihara<sup>1)2)</sup></u>

1) Department of Microbiology, Tokyo Dental College

2) Oral Health Science Center, Tokyo Dental College

3) Department of Pathology, Tokyo Dental College

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**Abstract:** Aggregatibacter actinomycetemcomitans is a pathogen associated with chronic and aggressive periodontitis and extra-oral infections. Fresh isolates of A. actinomycetemcomitans are fimbriated, forming small, rough-phenotype colonies on agar plates and also form biofilms. Recently, it has been reported that amyloid fibers are abundant in natural biofilms, and *Escherichia coli* and *Salmonella* spp. produce amyloid fibers that contribute to biofilm formation. This has yet to be reported, however, in A. actinomycetemcomitans. Amyloid binds the Congo red (CR) dye. In this study, therefore, we investigated amyloid formation in A. actinomycetemcomitans using a detection of CRbinding colonies on CR agar plates and CR-binding assay. All rough-phenotype strains formed dark red colonies and smooth-phenotype strains formed white or opaque red colonies on CR agar plates. Compared with smooth-phenotype strains, rough-phenotype strains showed higher CR-binding activity. CR-binding of rough-phenotype strain AKR was not affected by protease digestion or heating, whereas smooth-phenotype strain 29523 showed a marked reduction in CR-binding after both types of treatment. AKR showed amyloid-positive staining with CR to produce yellow green birefringence under polarized light, whereas 29523 showed amyloid-negative staining. These findings indicate that the CR-binding component of rough-phenotype A. actinomycetemcomitans is an amyloid-like fiber.

Key words: Aggregatibacter actinomycetemcomitans, Congo red-binding, Amyloid

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