

**Thesis of Ahmad Asadinezhad**  
**Faculty of Technology, Tomas Bata University in Zlin**

Titul of disertation thesis:

**„Bioactivity Enhancement of Polymers via Surfaře Modification“**

MSc. Ahmad Asadinezhad thesis investigates the enhancement of bioactivity of biomaterial, medical-grade poly(vinyl) chloride, against bacterial adhesion, growth and colonization by surface modification. The application of biomaterials in different fields of medicine is an area of growing interest with possible high economic impacts. The interdisciplinarity and collaborative approach of this thesis is very appreciated.

Thesis is well-presented in four chapters, overall redaction, tables and figures are satisfactory with minimum mistakes. The background is complete, the up to date literature search is well documented, the state-of-art methodology including physical methods, chemistry and antibacterial screening is adequately described, research objectives as well as finding synopsis are clearly defined. The final part of thesis includes three original full papers based on the complete results obtained during doctoral studies and published in respected scientific peer-review journals where detailed informations and discussion can be found. (IF factors of individual journals should be mentioned).

Aims of the thesis were fulfilled by using and combination of novel type of plasma technology, polymer brush formation, bonding of antimicrobial agents (triclosan, benzalkonium chloride, bronopol, chlorhexidine) and natural biomacromolecules (based on polysaccharides chitosan and pectin).

**Remarks and questions:**

1. During the antibacterial screening *Staphylococcus aureus* and *Escherichia coli* have been tested. Why only this two types of bacteria were selected, did you tested some anaerobic bacteria as well?
2. Why the cytotoxicity of your modified biomaterials has not been tested for comparison with nonmodified or with materials modified by other methods?
3. Could you describe advantages/disadvantages between your types of modification and biomaterial coated with nanosilver particles?
4. According to which criteria the tested concentrations of antibacterial agents for coating have been chosen ? Was the concentration range screened?

**Conclusion:**

From the thesis it is possible to conclude that Mr. Asadinezhad has matured into a scientist with capacity to perform research leading to practical applications.

In summary, I fully recommend the thesis of MSc. Ahmad Asadinezhad to be subjected to the defense and if succesfully defended, to give him PhD according to § 47, Law 111/98.

  
Prof. RNDr. Jitka Ulrichová, CSc.

Olomouc, June 10, 2010