Journal of Pulmonology and Clinical Research

Abstract

Survival of Recombinant Monoclonal Antibodies (IgG, IgA and sIgA) Versus Naturally-Occurring Antibodies (IgG and sIgA/IgA) in an Ex Vivo Infant Digestion Model

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Abstract:

Introduction: To prevent infectious diarrhea in infants, orally-supplemented enteric pathogen-specific recombinant antibodies would need to resist degradation in the gastrointestinal tract. Palivizumab, a recombinant antibody specific to respiratory syncytial virus (RSV), was used as a model to assess the digestion of neutralizing antibodies in infant digestion. The aim was to determine the remaining binding activity of RSV F protein-specific monoclonal and naturally-occurring immunoglobulins (Ig) in different isoforms (IgG, IgA, and sIgA) across an ex vivo model of infant digestion. RSV F protein-specific monoclonal immunoglobulins (IgG, IgA, and sIgA) and milk-derived naturally-occurring Ig (IgG and sIgA/IgA) were exposed to an ex vivo model of digestion using digestive samples from infants (gastric and intestinal samples). The survival of each antibody was tested via an RSV F protein-specific ELISA. Ex vivo gastric and intestinal digestion degraded palivizumab IgG, IgA, and sIgA ($p < 0.05$). However, the naturally-occurring RSV F protein-specific IgG and sIgA/IgA found in human milk were stable across gastric and intestinal ex vivo digestion. The structural differences between recombinant and naturally-occurring antibodies need to be closely examined to guide future design of recombinant antibodies with increased stability for use in the gastrointestinal tract.

Biography: Jiraporn Lueangsakulthai is a postdoctoral scholar in Department of Nutrition, College of Public Health and Human Sciences at Oregon State University, USA. She completed her B.Sc. (first class honors) in Biochemistry in Khon Kaen University. She completed her PhD in Biochemistry in 2018 at Khon Kaen University in Thailand mentored by Professor Sompong Klaynongsruang and Dr. Sarah E. Maddocks from the Department of Biomedical Sciences at Cardiff Metropolitan University in the UK. Her postdoctoral mentored by Assist. Prof. David C. Dallas at Oregon State University, USA. Her postdoctoral research focuses on examining the survival of palivizumab (humanized monoclonal antibody; IgG)

and naturally-occurring anti-respiratory syncytial virus F protein antibodies (sIgA, IgA and IgG) in the neonatal infant gut. She has developed a novel anti-idiotype palivizumab ELISA and RSV F protein-based ELISA technique to identify the survival of palivizumab in the neonatal infant gut. Her academic preparation throughout graduate program at Khon Kaen University and Cardiff Metropolitan University and postdoctoral scholar at Oregon State University provided her with a strong foundation in biochemistry (biological activities, proteomics, peptide characterization and identification), microbiology (bacterial killing mechanism, bacteriology, oxidative stress in bacteria, cell membrane damaging, siderophore production, iron dysregulation, and DNA damage) and infant nutrition (immunology based ELISA techniques).

References

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World Congress on Pulmonology and Respiratory Medicine, November 16, 2020

Citation: Jiraporn Lueangsakulthai, Survival of Recombinant Monoclonal Antibodies (IgG, IgA and sIgA) Versus Naturally-Occurring Antibodies (IgG and sIgA/IgA) in an Ex Vivo Infant Digestion Model, World Congress on Pulmonology and Respiratory Medicine, November 16, 2020