Development of Vi Polysaccharide Purification Method For Typhoid Conjugate Vaccine Material: Effect Of Ethanol Precipitation Variation To Impurities And Vi Polysaccharide

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Abstract: Typhoid fever is a disease caused by *Salmonella typhi* bacteria. One way to overcome this infectious disease is by immunization using vaccine based Vi polysaccharide material. Purification method of Vi polysaccharide has been developed but effectiveness not meet satisfactory since high impurities still present. For that reason, purification method of Vi polysaccharide was developed with focuses on the effect of ethanol precipitation variation to impurities and Vi polysaccharide. Based on the measurement of endotoxin value, 20% ethanol precipitation results gave endotoxin removal rate of -1.1289 and endotoxin value of 60% fraction at 338.7 EU/mL. Precipitation with ethanol 30% gave endotoxin removal rate of -0.9930 and endotoxin value of 60% fraction T 261.7 EU/mL. Precipitation with ethanol 40% gave endotoxin removal rate of -0.9147 and endotoxin value of 60% fraction at 580.7 EU/mL. Precipitation with ethanol 50% gave endotoxin removal rate of -0.9636 and endotoxin value of 60% fraction at 478.8 EU/mL. Sufficient to say that addition of 30% ethanol solution can increase the removal of endotoxin and nucleic acid without reducing the gain of Vi. Three times precipitation results with 20% ethanol gave the endotoxin removal rate of -1.0119 and endotoxin value of 60% fraction at 139.3 EU/mL, while three times precipitation with ethanol 30% gave endotoxin removal rate of -0.9938 and endotoxin value of 60% fraction at 102.5 EU/mL. Based on results, repeated three times precipitation process using 20% and 30% solutions can increase the removal of endotoxin and nucleic acid without reducing the gain of Vi polysaccharide.

Keywords: purification, typhoid vaccines, Vi polysaccharide

Dea Marsendah is Section Head of Hib Vaccine Production at Biofarma, the leading vaccine manufacturer in Indonesia. Been working in Hib Vaccine Production especially in Hib conjugation process for seven years, gives her lots of experience and deep understanding in vaccine production. Dea just finished her Master Degree in Biotechnology from Bandung Institute of Technology. Her research still related with vaccine production, with focus on purification as part of downstream processing.. She has also been a speaker at several international conferences related to bioprocess and biopharmaceutical. Between those, Dea manages to keep her exciting hobbies as scuba diver.