

The Hunting of Candidate Vaccines is Really Fun

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Veterinarians, is a profession that might not attract people to take. When we compare this profession which dealing a lot with animals with the medical doctor which dealing a lot with human beings, the medical doctor is more popular and will impressed people with "wow" status. But please wait! Look at the activities of Rahmat Hidayat, Osama Afif, Titiiek Sunartatie, and Fachriyan Hasmi Pasaribu; four Veterinarians whose jobs are vaccine researcher of the Medical Microbiology Section of Department of Veterinary Medicine and Public Health of the Faculty of Veterinary Medicine, Bogor Agricultural University (IPB), will probably surprise us. Why, those four Veterinarians are persistent in hunting the candidates of vaccines.

A vaccine is a biological preparation that improves immunity to a particular disease. A vaccine typically contains an agent that resembles a disease-causing microorganism, and is often made from weakened or killed forms of the microbe or its toxins. A vaccine that is hunted by those four young scientists is a Brucella vaccine. Probably some of you have heard of the Brucellosis disease? Brucellosis is a highly contagious zoonosis that primarily attack cattle, goats, pigs and other animals, and human as well. The transmission from human to human, through sexual contact or from mother to child, is rare but possible. Brucellosis in cattle in Indonesia has spread in 26 provinces and causes economic losses amounted to Rp 138.5 billion / year, due to miscarriage, death of calf, sterility and infertility and decreased milk production and quality.

The potential source of transmission of Brucellosis from animals to humans is the cow. The most common route of transmission occurs when humans from infected cow. Infected animals shed the organism into their milk, and if humans eat or drink unpasteurized dairy products from these affected animals, they can develop brucellosis. Fetal membranes and fluids of the reproductive tract is a source that can transmit disease to humans by direct contact. Brucella sp. can penetrate the skin, conjunctiva, and gastrointestinal tract. Transmission occurs in cattle orally. Cows that had a miscarriage by issuing brucellosis bacteria B. abortion in large numbers through the fetal membranes, reproductive fluids, urine and feces. These materials will contaminate the grass and drinking water.

The strong will to get the vaccine candidate of Brucella, caused Rahmat Hidayat and his team to implement the untiresome research programs. Their goals were to find a local isolate of Brucella vaccine for Brucellosis control in Indonesia. A series of research programs were performed such as isolation and characterization of local isolates of B. abortion as a candidate vaccine, characterization of the nature of the antigenicity and pathogenicity of B. abortion for the determination of local isolates to develop Brucella vaccine from the selected field isolates.

Type of vaccine utilized to control brucellosis is active vaccine B. abortus strain 19 (S19) and strain 51 (RB51). Unfortunately, each vaccine has several limitations. For example, the S19 vaccine causes persistent antibody titers in vaccinated cows so it is difficult to distinguish from natural infection (false positive test results), that cause miscarriages and vaccine strains can

be excreted through the milk. Additionally S19 vaccine can infect humans. Another example is the use of vaccines RB 51, which has been used since 1996 in several countries. But the safety and efficiency of RB 51 vaccine is still a matter of controversy. When it is given to pregnant cows it cause miscarriages and placentitis and it can also be excreted through the milk. Thus, they infect humans. From the economic point of view, the prices of these vaccines are relatively expensive, and they should be imported.

These facts had disturbed the concern Rahmat Hidayat and his team. They then determined to develop alternative vaccines that are safer, effective, and with a more affordable price. From a series of studies conducted Rahmat Hidayat and his team, they have obtained eight isolates, and based on the characterization of physiological/biochemical point to *B. abortus*. Six of those eight isolates, after being undergone to several tests showed different characteristics with *B. abortus* vaccine strain (S19 and RB 51) and was determined as isolates of potential vaccine candidates, while the other two isolates showed similar properties with strain S19.

The previous vaccine candidate hunting activities carried out by Rahmat Hidayat and his team certainly was not completely terminated. In the near future, another research program as the continuation of the the previous research program is waiting for them. It is to produce *Brucella* vaccines from the isolation of brucellosis vaccine locally in various ways and types and in collaboration with other scientists from other institutions. The production of local isolates is expected to reduce dependence on imported vaccines (saving foreign exchange), to support the meat self-sufficiency program and in turn the public welfare of Indonesian farmers. (Wied).