



SAN LUIS OBISPO COUNTY *Messenger* Public Health Laboratory

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Use of PCR Panels for detection of infections – a Lab Director’s Editorial

Among the advances seen in recent years in laboratory science is molecular detection of infection using micro-arrays and PCR (polymerase chain reaction) panels. The latter involves use of multiple DNA primers (short DNA segments), which each match a unique DNA sequence from a distinct pathogen. With a single test run, using DNA amplification and specific probes (molecules tagged with dyes or other reporter substances), identification of a single disease-causing agent is possible from amongst a panel of one to two dozen possible agents.

As many infections share a common set of signs and symptoms, it is difficult for clinicians to determine which single agent test(s) to order, particularly when dealing with a diarrheal or influenza-like illness. However, test orders for singular or a very small number of pathogen is precisely what occurs often in clinical settings, where ordering numerous tests may be considered financially irresponsible or lacking clinical acumen. A related issue of concern among public health authorities is that the increasing choice of molecular and other culture-independent testing (CiDTs), perhaps in an effort to speed results, may be leading to the abandonment of culturing pathogens. Such a loss of culture isolation can undermine the readiness and stability of public health laboratories and impedes the utility of surveillance systems. One such example is the CDC PulseNet system for foodborne illness which is a modern and critical tool for trace backs to origin of pathogen source location.

Fortunately, the SLO Public Health Laboratory is using advanced PCR panels such as the Respiratory Virus Panel (RVP) and the Gastrointestinal Pathogen Panel (GPP). As described earlier, such panels provide the means to identify specific agents by molecular amplification. These panels have the added public health benefit of allowing culturing of an agent after a molecular signal is observed.

The RVP panel, which can detect numerous respiratory pathogens, has proved useful in the case of an influenza virus outbreak at the County Jail. Some “cases” turned out to be human meta-pneumovirus (HMPV) which enabled a fine-tuned outbreak response. The RVP panel has also been used successfully in distinguishing potential Enterovirus-D68 (cause of recent polio-like illness cases) from Respiratory Syncytial virus (RSV), parainfluenza virus and others. Isolation of specific agents is also of value in evaluating new potential treatments; the Colorado Hospital for Children has reported that studies are in progress to determine if antivirals such as cidofovir and ribavirin can be used to treat infections caused by RSV, HMPV, adenovirus and parainfluenza virus.

The GPP panel has not been applied to a local outbreak as yet, but in 50% of cases where this panel has been used, often for prolonged symptoms, a specific causative agent has been identified (e.g., salmonella, campylobacter), with subsequent culture and recovery of the agent for surveillance characterization. Other agents include *Entamoeba histolytica* and Norovirus. The breadth of agents detected promises to solve medical mysteries that sometimes become a diagnostic odyssey for afflicted patients. The GPP has provided a specific diagnosis for travelers who have roamed exotic but less hygienic regions of the globe and brought back more than souvenirs.

I am encouraged by the performance of the PCR panels and believe that the needs of the medical community and public health can be served with the use of these assays. More are certain to come.

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