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PHI-Funded Research published in *Scientific Reports*, July 2017

Team's new methods validated; second article in progress

“Revealing enterovirus infection in chronic human disorders: An integrated diagnostic approach” authored by Angelo Genoni, Filippo Canducci, Agostino Rossi, Francesco Broccolo, Konstantin Chumakov, Giorgio Bono, Jorge Salerno-Uriarte, Alessandro Salvatoni, Alberto Pugliese & Antonio Toniolo was published online in *Scientific Reports* 10 July 2017. They chose to make the article open access and so it is freely available at <http://rdcu.be/t4V4>.

Lead researcher, Antonio Toniolo, MD, Professor of Medical Microbiology, University of Insubria, Varese, Italy, reports, “This paper provides the evidence and justification for polioviruses being still present in the bodies of polio survivors after so many years.”

“I am glad that the results have been validated by an expert in the field, Konstantin M. Chumakov, PhD, Office of Vaccines Research and Review (OVRR) at the Food and Drug Administration. As an aside, he is the son of the famous Russian virologist Michael Chumakov who introduced the American poliovirus vaccines in the former Soviet Union. By 1959, the elder Chumakov organized the first mass production and clinical trials of the Oral Poliovirus Vaccine (OPV) made from live attenuated strains developed by Albert Sabin.

“We are preparing a full paper on post-polio with data from over 100 polio survivors now that the technicalities of the method have been approved for publication.”

Basically, the study shows that the protracted persistence of poliovirus in post-polio survivors can be demonstrated by analyzing blood leukocytes for the presence of virus. The original method set up in Italy is based on the *in vitro* cultivation of blood leukocytes and the further examination by genomic methods, i.e., polymerase-chain reaction (PCR) followed by virus genome sequencing. In addition to that, investigators have also been able to show that persistent polioviruses maintain their ability to produce virus structural proteins when propagated in cell cultures. Thus two independent lines of evidence point to the conclusion that—decades after the initial acute poliovirus attack—a minimal population of

mutated virus remains still present in a portion of polio survivors.

The authors speculate that the presence of persistent poliovirus could be responsible for chronic inflammation (probably within the central nervous system and skeletal muscles). Studies are progressing with the idea of finding antiviral drugs capable of blocking the ongoing poliovirus replication in poliovirus-positive polio survivors.

The evidence provided by the study also provides support for the administration of intravenous immunoglobulins to post-polio subjects (an international clinical trial is currently ongoing with the support of Grifols, an immunoglobulin manufacturer). An additional possibility may be represented by the therapeutic administration of the existing poliovirus vaccines.

The team of researchers received funds from PHI both in 2009 (\$25,000) and in 2014-15 (\$50,000 each year). For details, see www.polioplace.org/phi-funded-research.

Scientific Reports is part Nature Research, the home of high impact scientific and medical information in print and online. The Nature Research portfolio includes Nature (www.nature.com).

The Research Fund receives donations from PHI Members, families and the estates of survivors.

Call for Proposals for PHI Research Fund Grant *Deadline for 2018: Monday, October 2, 2017*

Funding in the amount of \$50,000 is available from Post-Polio Health International and International Ventilator Users Network for research to be completed in 2018. Application for the funds must be received by October 2, 2017. (Applicants may apply for \$100,000 for a study taking two years to complete.)

Researchers can choose to apply for one of the two grants described below.

The Thomas Wallace Rogers Memorial Respiratory Research Grant to study the management of neuromuscular respiratory insufficiency or to explore historical, social, psychological and independent living aspects of long-term home mechanical ventilation

The Post-Poliomyelitis Research Grant to study the cause(s), treatment and management of the late effects of polio or to explore historical, social, psychological and independent living aspects of living with polio.

The research must have the potential to improve the lives of polio survivors or users of home mechanical ventilation. For details on the application process and to access the form, see www.polioplace.org/phi-funded-research/new-request-2018-award. ■