

# COMPARISON OF IMMUNOMAGNETIC SEPARATION AND ULTRACENTRIFUGATION AS CONCENTRATION METHODS FOR HUMAN MASTADENOVIRUS IN WATER SAMPLPES

Juliana Schons Gularte\*<sup>1</sup>, Roana de Oliveira Hansen<sup>2</sup>, Meriane Demoliner<sup>1</sup>, Jacek Fiutowski<sup>2</sup>, Ana Karolina Eisen<sup>1</sup>, Horst-Günter Rubahn<sup>2</sup>, Fernando Rosado Spilki<sup>1</sup>.

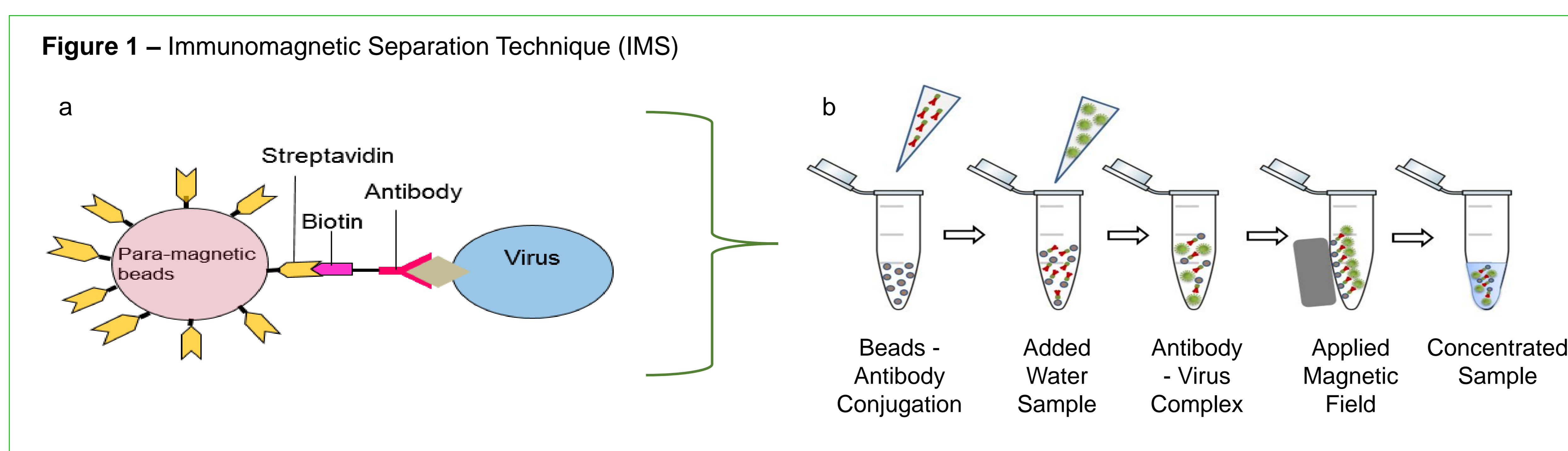
<sup>1</sup> Laboratório de Microbiologia Molecular, Universidade Feevale, RS 239 nº 2755, Novo Hamburgo, RS 93352-000, Brasil.

<sup>2</sup> The Mads Clausen Institute, NANOSYD, University of Southern Denmark, 6400 Sønderborg, Denmark.

\*julianaschons@hotmail.com

## INTRODUCTION

Even though viruses are discarded in large quantities in water resources by domestic sewage releases, they may be present in very low amounts in water samples, making direct analysis and detection a challenge, thus it is often needed concentration of large sample volumes. Therefore, rapid and reliable methods are needed to detect a small number of viral particles, especially infectious, in environmental samples. Immunomagnetic separation (IMS) is a method that concentrates viral particles through the use of an antibody-antigen complex (Fig.1a). Magnetic particles are coated with a specific antibody for the target pathogen. The pathogen binds to the specific antibody and the antigen-antibody complex can easily be concentrated in a small volume by applying an external magnetic field (Fig.1b).



## OBJECTIVE

The goals of this study were to standardize IMS combined with real-time polymerase chain reaction (qPCR) (IMS-qPCR) to detection of *Human mastadenovirus* (HAdV) in water samples and to compare difference in the viral concentration methods between ultracentrifugation and IMS.

## MATERIALS AND METHODS

Fifteen sites with different kinds of superficial water were sampled in a city of the South of Brazil where a gastroenteritis outbreak was reported. The samples were concentrated by ultracentrifugation and IMS. In the IMS step, monoclonal and polyclonal antibodies against HAdV were used to coat the paramagnetic beads. For viral detection, qPCR assays were performed using a specific primer (VTB1) to detected HAdV species F (HAdV-F).

## RESULTS

Sites	Ultracentrifugation	IMS - Monoclonal	IMS - Polyclonal
	GC/L	GC/L	GC/L
1	-	7.66E+06	1.84E+06
2	-	-	1.39E+05
3	-	1.18E+07	-
4	-	-	2.85E+06
5	-	-	1.85E+06
6	-	-	2.07E+05
7	-	2.72E+06	-
8	-	-	1.47E+06
9	-	3.04E+05	2.91E+06
10	-	5.42E+05	4.78E+05
11	-	1.85E+06	3.03E+06
12	-	1.91E+05	-
13	-	6.70E+05	-
14	-	3.40E+06	5.38E+05
15	-	3.59E+05	5.49E+06

## DISCUSSION

Until now, IMS showed to be a concentration step to viral particles more effective than ultracentrifugation. IMS is considered a versatile assay with very high specificity, so special attention needs to be given for this method. The use of IMS-qPCR demonstrated to improve the assessment of HAdV in water resources.

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