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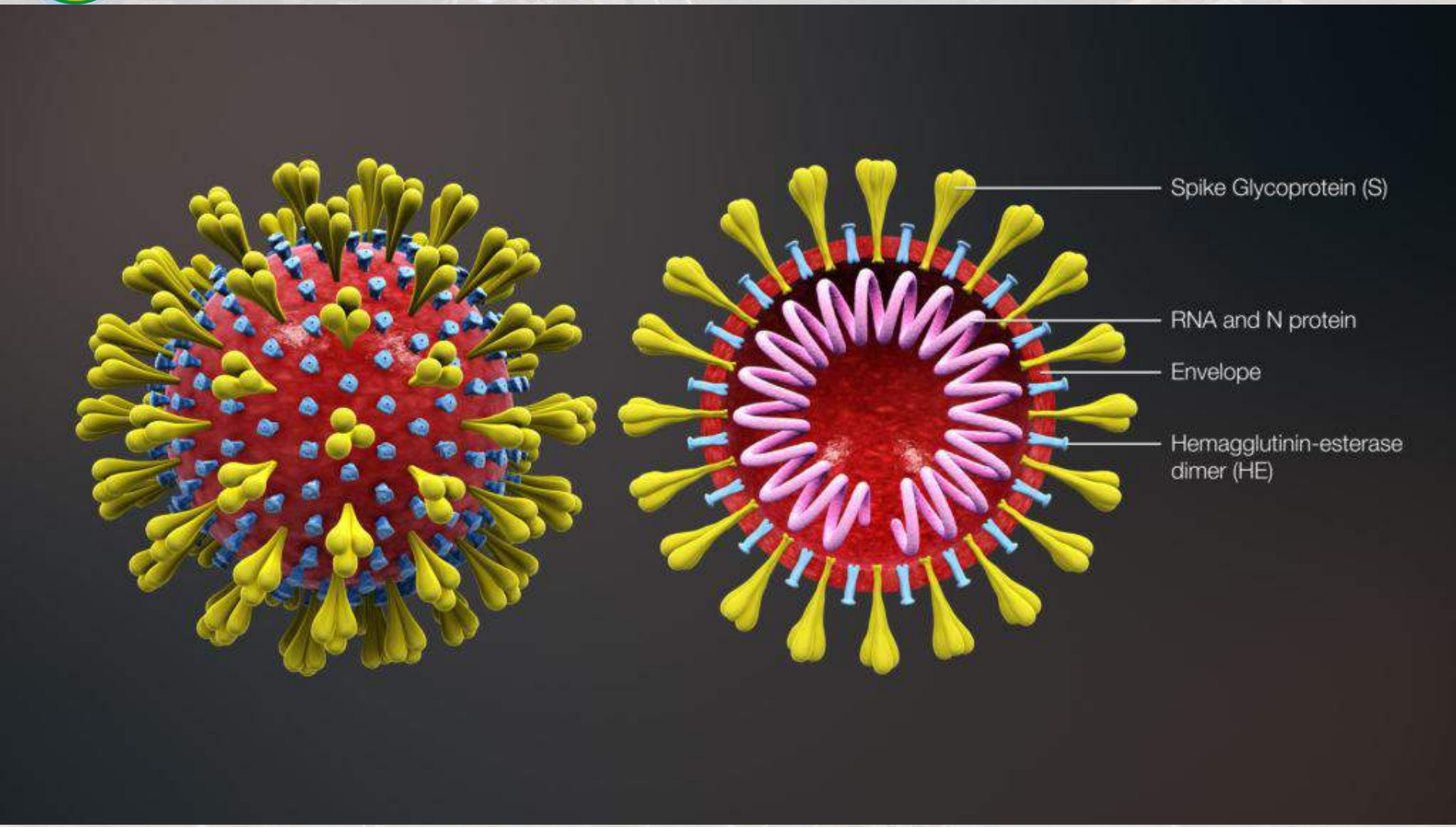
Webinar ABES - CTTE

O novo coronavirus e os sistemas de esgotamento sanitário

Prof. César Mota

Departamento de Engenharia Sanitária e Ambiental - Universidade Federal de Minas Gerais
Instituto Nacional de Ciência e Tecnologia em Estações Sustentáveis de Tratamento de Esgoto

Como é o novo coronavirus?



3D medical animation still shot showing the structure of a coronavirus. wikipedia, CC BY-SA

Covid-19 e o esgoto: o que se sabe até agora...

– **RNA viral encontrado em fezes**

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BRIEF COMMUNICATION
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JID: YJINF [m5G;April 18, 2020;1:48]
Journal of Infection xxx (xxxx) xxx

Contents lists available at ScienceDirect

Journal of Infection

journal homepage: www.elsevier.com/locate/jinf

ELSEVIER

Letter to the Editor

Commentary

COVID-19 and the gastrointestinal tract: more than meets the eye

Siew C Ng [1], Herbert Tilg [2]

An outbreak of coronavirus disease 2019 (COVID-19), caused by severe acute respiratory syndrome (SARS-CoV-2), has rapidly spread from China to almost all over the world affecting over 800,000 people across 199 countries. Whereas

Overall, 58/95 cases (61.1%) showed evidence of GI symptoms with diarrhoea (24.2%), nausea (17.9%), vomiting (4.2%) and impaired liver function as assessed by elevated transaminases (32.6%) being the most relevant features. Importantly,

RNA sequencing data, they found that ACE2 was highly expressed in the small intestine especially in proximal and distal enterocytes. They also found that two other viral entry receptors for human coronavirus 229E virus and Middle East respiratory syndrome CoV virus were highly expressed in enterocytes.[11] To take these findings further, Zhang *et al* examined ACE2-expressing cell composition and proportion in five public datasets with single-cell transcriptomes of lung, oesophagus, gastric, ileum and colon.[8] They found that successful virus entry

Covid-19 e o esgoto: o que se sabe até agora...

– RNA viral detectado em esgoto

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Science of The Total Environment

Available online 18 April 2020, 138764

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Time course quantitative detection of SARS-CoV-2 in Parisian wastewaters correlates with COVID-19 confirmed cases

Sebastien Wurtzer, Vincent Marechal, Jean-Marie Mouchel, Laurent Moulin

doi: https://doi.org/10.1101/2020.04.12.20062679

This article is a preprint and has not been peer-reviewed [what does this mean?]. It

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SARS-CoV-2 titers in wastewater are higher than expected from clinically confirmed cases

Fuqing Wu, Amy Xiao, Jianbo Zhang, Xiaoqiong Gu, Wei Lin Lee, Kathryn Kauffman, William Hanage, Mariana Matus, Newsha Ghaeli, Noriko Endo, Claire Duvallet, Katya Moniz, Timothy Erickson, Peter Chai, Janelle Thompson, Eric Alm

doi: https://doi.org/10.1101/2020.04.05.20051540

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Presence of SARS-Coronavirus-2 in sewage

Gertjan Medema, Leo Heijnen, Goffe Elsinga, Ronald Italiaander, Anke Brouwer

doi: https://doi.org/10.1101/2020.03.29.20045880

This article is a preprint and has not been peer-reviewed [what does this mean?]. It reports new medical research that has yet to be evaluated and so should *not* be used to

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Comment on this pap

Metropolitan Wastewater Analysis for COVID-19 Epidemiological Surveillance

Walter Randazzo, Enric Cuevas-Ferrando, Rafael Sanjuan, Pilar Domingo-Calap, Gloria Sanchez

doi: https://doi.org/10.1101/2020.04.23.20076679

This article is a preprint and has not been certified by peer review [what does this mean?]. It reports new medical research that has yet to be evaluated and so should *not* be used to guide clinical practice.

Covid-19 e o esgoto: o que se sabe até agora...

– **Vírus viável isolado a partir de fezes e urina**

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CHINA CDC WEEKLY

CCDC weekly

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Notes from the Field: Isolation of 2019-nCoV from a Stool Specimen of a Laboratory-Confirmed Case of the Coronavirus Disease 2019 (COVID-19)

Yong Zhang[1,&]; Cao Chen[1,&]; Shuangli Zhu[1]; Chang Shu[2]; Dongyan Wang[1]; Jingdong Song[1]; Yang Song[1]; Wei Zhen[1]; Zijian Feng[3]; Guizhen Wu[1]; Jun Xu[2]; Wenbo Xu[1]

View author affiliations

Gastroenterology 2020;■:1–3

Q1 Q2 Q3 **Evidence for Gastrointestinal Infection of SARS-CoV-2**

Q24 **Fei Xiao,**[1,2,3,*] **Meiwen Tang,**[4,*] **Xiaobin Zheng,**[5,*] Ye Liu,[6] Xiaofeng Li,[7] and Hong Shan[2,3,8]

[1]Department of Infectious Diseases, the Fifth Affiliated Hospital, Sun Yat-sen University, Zhuhai, Guangdong Province, China; [2]Guangdong Provincial Engineering Research Center of Molecular Imaging, the Fifth Affiliated Hospital, Sun Yat-sen University, Zhuhai, Guangdong Province, China; [3]Guangdong Provincial Key Laboratory of Biomedical Imaging, the Fifth Affiliated Hospital, Sun Yat-sen University, Zhuhai, Guangdong Province, China; [4]Department of Hematology, the Fifth Affiliated

Emerging Microbes & Infections

ISSN: (Print) 2222-1751 (Online) Journal homepage: https://www.tandfonline.com/loi/temi20

Isolation of Infectious SARS-CoV-2 from Urine of a COVID-19 Patient

Jing Sun, Airu Zhu, Heying Li, Kui Zheng, Zhen Zhuang, Zhao Chen, Yongxia Shi, Zhaoyong Zhang, Si-bei Chen, Xuesong Liu, Jun Dai, Xiaobo Li, Shuxiang

Transmissão feco-oral?

– **Transmissão feco-oral?**

Science of the Total Environment 729 (2020) 138919

Contents lists available at ScienceDirect

Science of the Total Environment

journal homepage: www.elsevier.com/locate/scitotenv

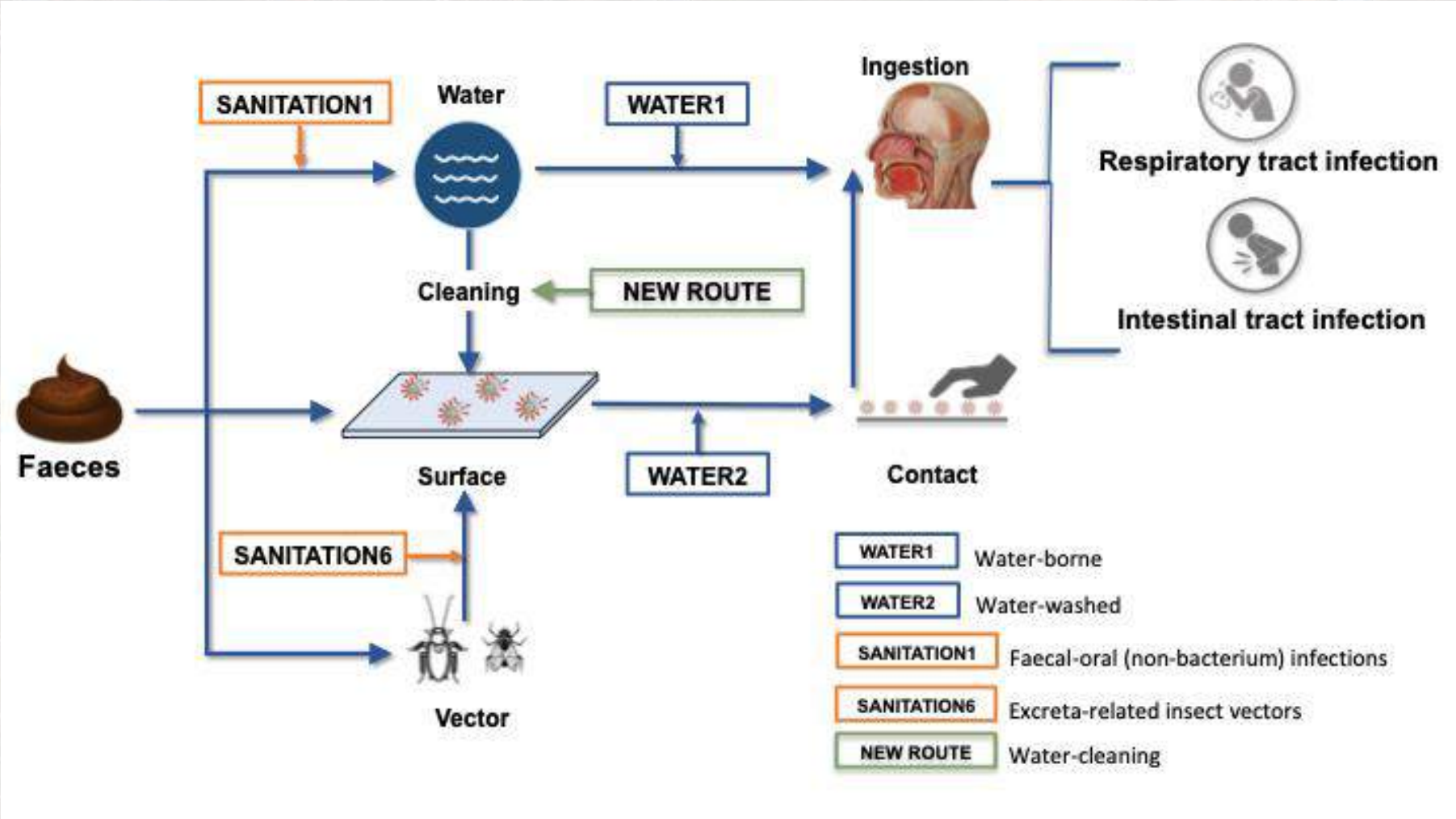
Short Communication

COVID-19 faecal-oral transmission: Are we asking the right questions?

Léo Heller [a,*], César R. Mota [b], Dirceu B. Greco [c]

[a] René Rachou Institute, Oswaldo Cruz Foundation, Av. Augusto de Lima, 1715, Belo Horizonte 30190-002, Brazil
[b] Department of Sanitary and Environmental Engineering, Federal University of Minas Gerais, Brazil
[c] Faculty of Medicine, Federal University of Minas Gerais, Av. Prof. Alfredo Balena, 190, Belo Horizonte 30130-100, Brazil

Transmissão feco-oral?



Artigos que confirmam transmissão feco-oral?

NENHUM

Transmissão feco-nasal?

WHO/CDS/CSR/GAR/2003.11

Consensus document on the epidemiology of severe acute respiratory syndrome (SARS)

WHO Consensus document on the epidemiology of severe acute respiratory syndrome (SARS). World Health Organization, 2003
https://apps.who.int/iris/handle/10665/70863

THE LANCET
Global Health

CORRESPONDENCE | VOLUME 8, ISSUE 5, E643, MAY 01, 2020

COVID-19: mitigating transmission via wastewater plumbing systems

Michael Gormley • Thomas J Aspray • David A Kelly

Open Access • Published: March 23, 2020 • DOI: https://doi.org/10.1016/S2214-109X(20)30112-1

O papel do esgoto na sociedade

- 1840s: fonte de doenças
- 2000s: fonte de doenças + recursos
- 2010s: fonte de doenças + recursos + ferramenta de vigilância sanitária/epidemiológica

O esgoto como ferramenta de vigilância epidemiológica

SUPPLEMENT ARTICLE

Environmental Surveillance for Polioviruses in the Global Polio Eradication Initiative

Humayun Asghar,[1] Ousmane M. Diop,[3] Goitom Adefunke O. Akande,[5] Eman Al Maamoun,[2] Sol M. Steve Oberste,[9] and Sara A. Lowther[9]

[1]World Health Organization, Eastern Mediterranean Region

AEM
Journals.ASM.org

Detection of Pathogenic Viruses in Sewage Provided Early Warnings of Hepatitis A Virus and Norovirus Outbreaks

Maria Hellmér,[a] Nicklas Paxéus,[b] Lars Magnius,[c] Lucica Enache,[b] Bi
Heléne Norder[a,c]

Department of Clinical Microbiology, Sahlgrenska Academy, Gothenburg University,
Stockholm, Sweden[c]; Department of Communicable Disease Control, Västra Götaland

Environment International 139 (2020) 105689

Contents lists available at ScienceDirect

Environment International

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Future perspectives of wastewater-based epidemiology: Monitoring infectious disease spread and resistance to the community level

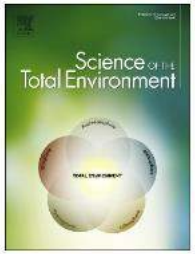
Natalie Sims, Barbara Kasprzyk-Hordern

Department of Chemistry, University of Bath, Bath BA2 7AY, UK
Centre for Doctoral Training in Sustainable Chemical Technologies, University of Bath, Bath BA2 7AY, UK

Journal Pre-proof

Computational analysis of SARS-CoV-2/COVID-19 surveillance by wastewater-based epidemiology locally and globally: Feasibility, economy, opportunities and challenges

Olga E. Hart, Rolf U. Halden



Com base no monitoramento do esgoto, em teoria, um indivíduo infectado pode ser detectado dentre uma população de 100 a 2 milhões de habitantes

Detecção e quantificação do novo coronavirus no esgoto de BH e Contagem

Coordenação: Profa. Juliana Calabria

Sub-coordenação: Prof. Carlos Chernicharo e Prof. Cesar Mota

- **Amostragem em vários pontos do sistema de esgotamento sanitário de BH e contagem**
- **Quantificação do RNA viral no laboratório de microbiologia do DESA/UFMG**
- **Cruzamento com dados da SES e construção de mapas da circulação do vírus em diferentes áreas**
- **Apoio na tomada de decisão**

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WEBINAR - 3ª semana de maio 2020

COVID-19: Monitoramento do esgoto como ferramenta de vigilância epidemiológica

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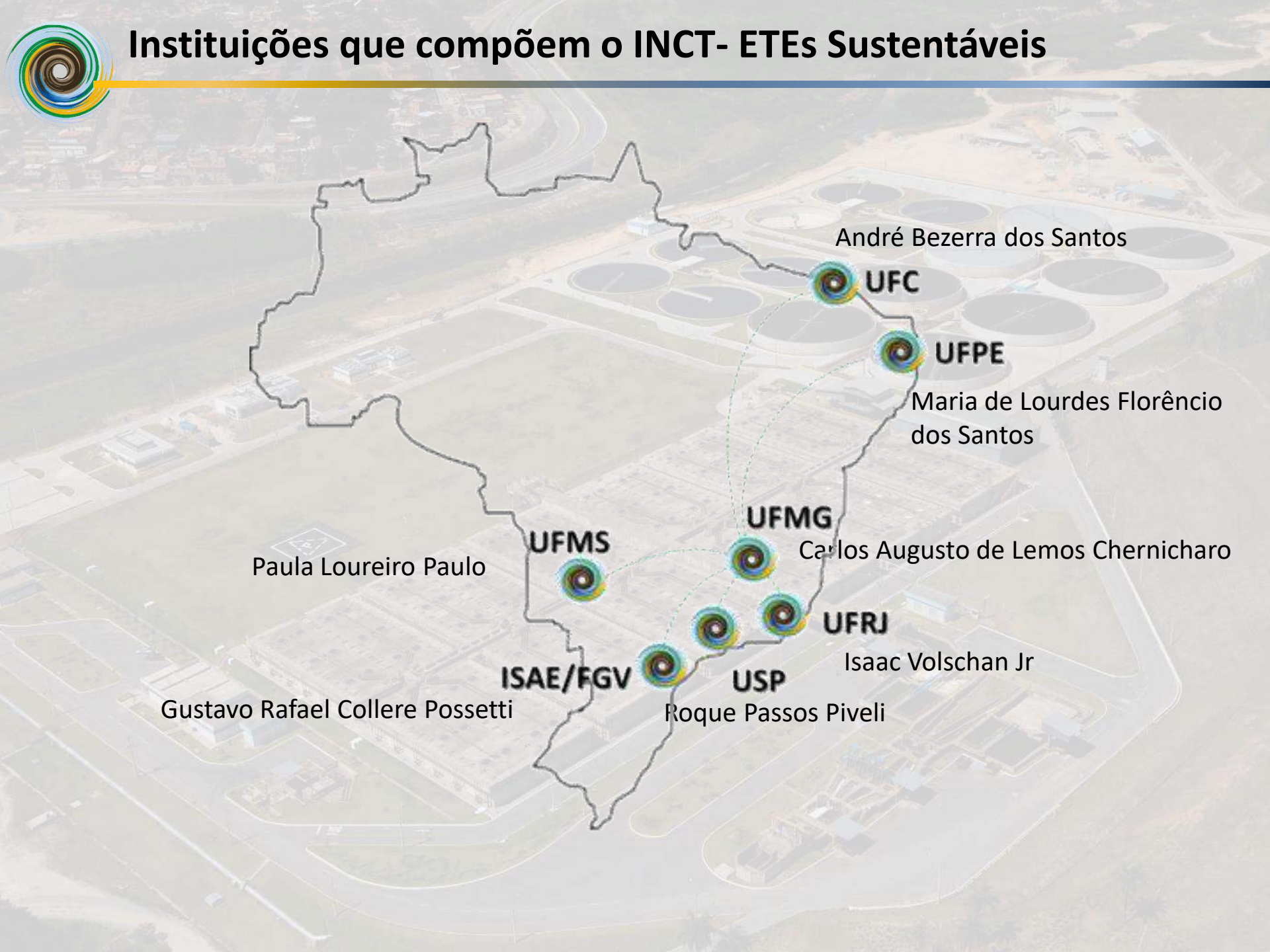
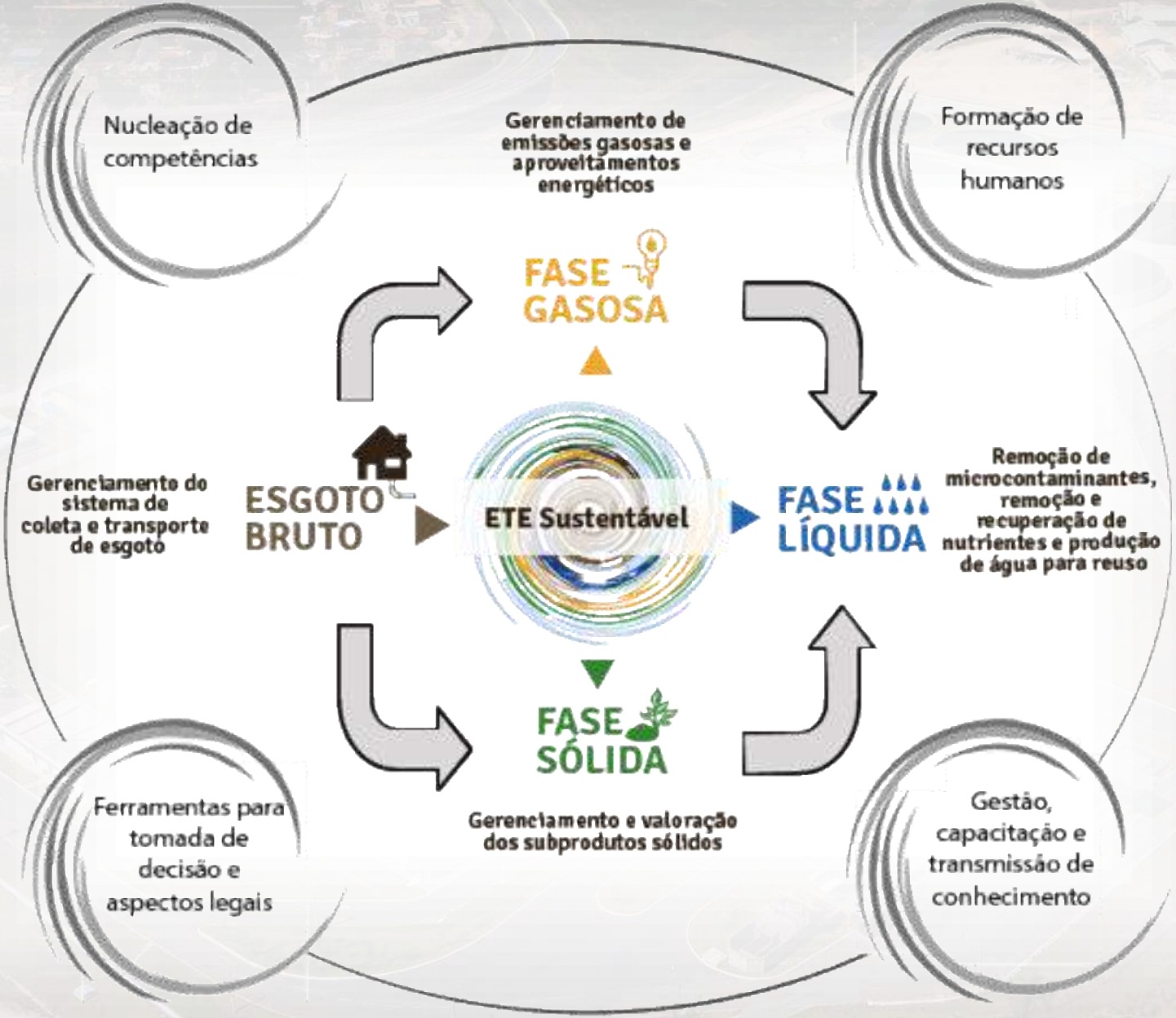


Pilares Estratégicos



Obrigado!

inct.etes.sustentaveis@gmail.com