Commentary

2020: A year to remember

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A R T I C L E I N F O

2020 has been difficult, to say the least. Although many might wish to forget this year even happened, as a scientific journal, we know that it was not all negative. Witnessing how researchers and clinicians overcame difficult conditions to continue to provide important contributions in their respective fields was a reason for profound optimism. To help everyone remember the brighter side of 2020, we are looking back at ten of the most interesting and most representative articles we have published this year.

It might come as no surprise that half of our selection is related to the COVID-19 pandemic. We have also selected one article from each of our four most popular topics (ie, oncology, infectious diseases, metabolism, and neurology), and a final paper on reproductive medicine—a field we have been following with interest.

1. COVID-19: From disease characteristics to vaccine candidates

The scientific community has worked at an incredible pace during the COVID-19 pandemic to understand disease mechanisms, to provide clinicians with the tools to triage patients, and to test treatments and develop vaccines against the SARS-CoV-2 virus. As a translational journal, we have the privilege of publishing articles across this whole research spectrum. Jing Liu and colleagues [1] from Huazhong University of Science and Technology (Wuhan, China) described the longitudinal characteristics of lymphocyte responses and cytokine profiles in the peripheral blood of 40 patients infected with SARS-CoV-2. These data suggested that loss of cytotoxic T lymphocytes and increases of proinflammatory cytokines might be key players in COVID-19 pathogenesis. Pere Domingo and colleagues [2] from Hospital de la Santa Creu i Sant Pau (Barcelona, Spain) reviewed studies on the pathogenesis of SARS-CoV-2 infection and proposed the metaphor of the four horsemen of a viral apocalypse. Disease pathogenesis was represented as an interaction between viral replication, hyperinflammation, the non-canonical renin-angiotensin system axis, and

hypercoagulation pathways. Fabio Facchetti and colleagues [3] from the University of Brescia (Brescia, Italy) leveraged meticulous immunohistochemical, electron microscopy, and molecular analyses of the placenta of 101 women to provide evidence for maternal−fetal transmission of the virus. This report confirmed that vertical transmission of SARS-CoV-2 infection is a rare, yet existing event and described the biological conditions that could enable the passage of the virus across the maternal−fetal interface.

On the basis of initial observations of disease characteristics, clinicians have tried to identify biomarkers associated with COVID-19 outcomes. However, measuring individual cytokines (such as the ones described by Liu and colleagues) at initial presentation has not been a successful strategy because of individual variability and the influence of external factors on their baseline levels. Oliver McElvaney and colleagues [4] from The Royal College of Surgeons (Dublin, Ireland) instead proposed to use the change of a composite cytokine profile over the course of the disease; an index they called the Dublin-Boston score. Finally, Eun Kim and colleagues [5] from the University of Pittsburgh (Pittsburgh, PA, USA) described the development of microarray needle-delivered coronavirus vaccines, testing immunogenicity in a murine preclinical model. These authors used their previous experience with MERS-CoV vaccines to rapidly develop a SARS-CoV-2 vaccine, which was indeed the first vaccine candidate proposed in a peer-review journal.

2. The best of the rest

- Oncology: CUP-AI-Dx: a tool for inferring cancer tissue of origin and molecular subtype using RNA gene-expression data and artificial intelligence

Cancer of unknown primary (CUP) is a metastatic cancer in which a primary site of origin cannot be determined using standard diagnostic tools. This issue makes this type of cancer more difficult to treat. Yue Zhao and colleagues [6] from the Jackson laboratory (Farmington, CT, USA) developed an RNA-based classifier using artificial intelligence that identified the primary site in clinical datasets from Australia and the USA with a respective accuracy of 72% and 89%. The model and results are publicly available as a software package to allow reproduction of the results and application to new datasets.

- Infectious diseases: a three-marker protein biosignature distinguishes tuberculosis from other respiratory diseases in Gambian children

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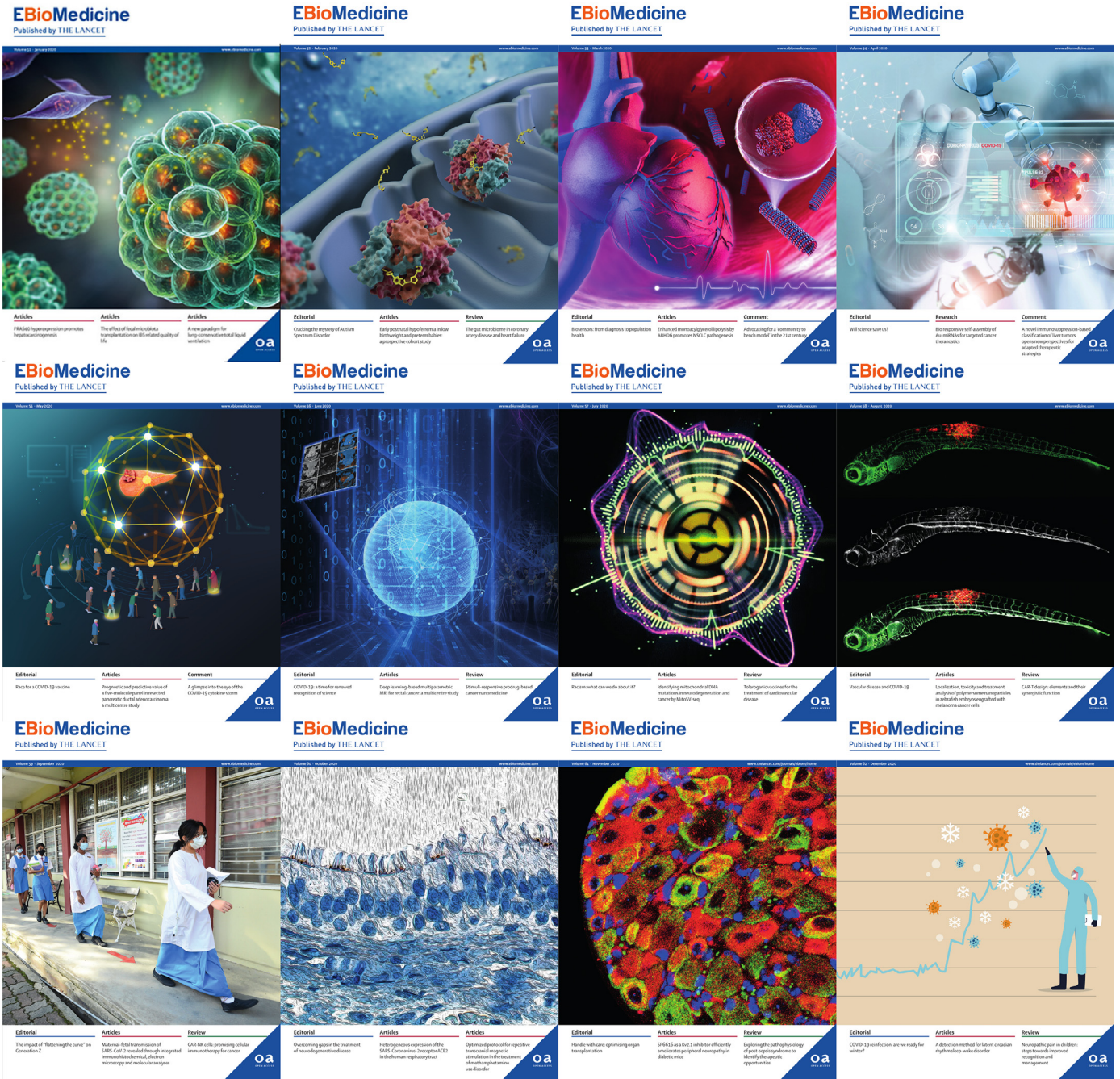
Toyin Togun and colleagues [7] from the London School of Hygiene & Tropical Medicine (London, UK) described blood biomarkers to distinguish tuberculosis from other respiratory diseases in Gambian children. This study is one of the few focused on non-sputum diagnostic approaches in children. The results are promising and support the development of point-of-care tests using this blood signature.

- Metabolism: Ileo-colonic delivery of conjugated bile acids improves glucose homoeostasis via colonic GLP-1-producing enteroendocrine cells in human obesity and diabetes

Calderon and colleagues [8] from Mayo Clinic (Rochester, MN, USA) presented a comprehensive study of the role of bile acids (BA) in glucose homoeostasis. With three experiments—the study of BA receptor pathway in cell lines, the characterisation of the pathway in study participants, and a study of the effect of conjugated BA on metabolism in a placebo-controlled trial—the authors provide evidence of the effects of BA on the pathophysiology of obesity and diabetes. Indeed, glucose homoeostasis was improved by stimulation through ileo-colonic delivery of conjugated BAs.

- Neurology: the effects of repetitive transcranial magnetic stimulation on cue-induced craving in male patients with heroin use disorder

Xiaoli Liu and colleagues [9] from Shanghai Jiao Tong School of Medicine (Shanghai, China) published a trial investigating the

effects of repetitive transcranial magnetic stimulation (rTMS) on patients with heroin use disorder. The study, done in 118 male patients, indicated that rTMS treatment was effective at reducing drug craving and that the effect lasted for up to 60 days after cessation of treatment.

- Reproductive medicine: Impact of sitagliptin on endometrial mesenchymal stem-like progenitor cells: a randomised, double-blind placebo-controlled feasibility trial

Shreeya Tewari and colleagues [10] from University of Warwick (Coventry, UK), presented the results of a randomised placebo-controlled feasibility trial on the impact of sitagliptin on endometrial mesenchymal stem-like progenitor cells in women with recurrent pregnancy loss. They showed evidence that endometrial plasticity during the implantation window can be enhanced pharmacologically. A larger clinical trial appeared feasible and should be done to prove effectiveness of this treatment for miscarriage prevention.

3. Reviews and other content

In addition to this selection of ten research articles, we would also like to bring your attention to the leading-edge reviews that we published this year. This included our first cross-journal series, published in collaboration with *The Lancet Oncology* and *The Lancet Gastroenterology & Hepatology,* which was focused on the latest advances across pancreatic cancer research.

Finally, we would like to conclude by inviting you to read inspiring letters from women and minority researchers sharing their experiences and ideas. These letters can be found on the hubs of the *Lancet* group: the GRacE hub for racial equality (https://www.thelancet.com/racial-equality) and the Gender Equality in Health hub (https://info.thelancet.com/eclinm-gender-equality-collection). These letters reflect the values of social justice, equity, and equality that we strive to uphold in our journal, and for which excellent quality global research is not possible without.

References

[1] Liu J, Li S, Liu J, et al. Longitudinal characteristics of lymphocyte responses and cytokine profiles in the peripheral blood of SARS-CoV-2 infected patients. EBioMedicine 2020;55:102763.

[2] Domingo P, Mur I, Pomar V, Corominas H, Casademont J, de Benito N. The four horsemen of a viral apocalypse: the pathogenesis of SARS-CoV-2 infection (COVID-19). EBioMedicine 2020;58:102887.

[3] Facchetti F, Bugatti M, Drera E, et al. SARS-CoV2 vertical transmission with adverse effects on the newborn revealed through integrated immunohistochemical, electron microscopy and molecular analyses of Placenta. EBioMedicine 2020;59:102951.

[4] McElvaney OJ, Hobbs BD, Qiao D, et al. A linear prognostic score based on the ratio of interleukin-6 to interleukin-10 predicts outcomes in COVID-19. EBioMedicine 2020;61(Nov):103026.

[5] Kim E, Erdos G, Huang S, et al. Microneedle array delivered recombinant corona-virus vaccines: Immunogenicity and rapid translational development. EBioMedicine 2020;55:102743.

[6] Zhao Y, Pan Z, Namburi S, et al. CUP-AI-Dx: a tool for inferring cancer tissue of origin and molecular subtype using RNA gene-expression data and artificial intelligence. EBioMedicine 2020;61:103030.

[7] Togun T, Hoggart CJ, Agbla SC, et al. A three-marker protein biosignature distinguishes tuberculosis from other respiratory diseases in Gambian children. EBioMedicine 2020;58:102909.

[8] Calderon G, McRae A, Rievaj J, et al. Ileo-colonic delivery of conjugated bile acids improves glucose homeostasis via colonic GLP-1-producing enteroendocrine cells in human obesity and diabetes. EBioMedicine 2020;55:102759.

[9] Liu X, Zhao X, Liu T, et al. The effects of repetitive transcranial magnetic stimulation on cue-induced craving in male patients with heroin use disorder. EBioMedicine 2020;56:102809.

[10] Tewary S, Lucas ES, Fujihara R, et al. Impact of sitagliptin on endometrial mesenchymal stem-like progenitor cells: a randomised, double-blind placebo-controlled feasibility trial. EBioMedicine 2020;51:102597.