Reviva Pharmaceuticals Presented Foundational Preclinical Data on Novel Serotonin-Dopamine Stabilizer Brilaroxazine at the 78th Annual SOBP and Publication in Medical Research Archives

Multifaceted activity of brilaroxazine supports potential for improvement in behavioral symptoms as well as accompanying neuroinflammation

This proof-of-concept data supported the initial clinical development of brilaroxazine and reinforces the clinical profile demonstrated in the Phase 2 REFRESH trial

Topline data from Phase 3 RECOVER trial for brilaroxazine in schizophrenia expected mid-2023

CUPERTINO, Calif., May 01, 2023 — Reviva Pharmaceuticals Holdings, Inc. (NASDAQ: RVPH) ("Reviva" or the "Company"), a clinical-stage pharmaceutical company developing therapies that seek to address unmet medical needs in the areas of central nervous system (CNS), respiratory and metabolic diseases, has presented the foundational preclinical data that supported the initial clinical development of its novel serotonin-dopamine stabilizer brilaroxazine at the 78th Annual Scientific Convention of the Society of Biological Psychiatry (SOBP) in San Diego. The Company also announced acceptance of this data for publication in *Medical Research Archives*. The SOBP poster and online publication will be available at revivapharma.com/publications.

"We were pleased to present at SOBP and simultaneously publish in *Medical Research Archives* these foundational preclinical data highlighting the antipsychotic effects of brilaroxazine on pharmacologic-induced behaviors associated with psychosis and schizophrenia in translational animal models," said Laxminarayan Bhat, Ph.D., Founder, President, and CEO of Reviva. "Building on the proof-of-concept data that supported the clinical development of brilaroxazine, these data reinforce the favorable clinical profile seen following dopamine and serotonin pathway modulation in our Phase 2 REFRESH trial in schizophrenia. We believe the multifaceted activity of brilaroxazine is the basis for this significant impact on behavioral symptoms and accompanying neuroinflammation, differentiating brilaroxazine as a next-generation treatment for conditions driven by dysfunctional dopamine and serotonin signaling. We look forward to topline data from our Phase 3 RECOVER trial expected in mid-2023."

Schizophrenia is accompanied by a complex mix of positive, negative, and mood symptoms, cognitive impairment, and immune system abnormalities associated with dysfunctional dopamine and serotonin signaling. Limitations of current antipsychotics, predominantly dopamine or dopamine and serotonin receptor selective compounds, include refractory response, suboptimal effectiveness of major symptoms, adherence, and neurological and cardiometabolic side effects. Preclinical studies in three different translational rodent models

capturing the heterogeneity in symptom cluster and severity were used to evaluate the potential of brilaroxazine to address the major symptom domains among patients with schizophrenia.

Key highlights from the poster presentation and publication support brilaroxazine's differentiated profile:

- Brilaroxazine demonstrated significant antipsychotic effects on pharmacologic-induced behaviors associated with psychosis and schizophrenia in three standard translational rodent models:
    - Apomorphine-induced (dopamine agonism) climbing rodent models represent symptoms of acute schizophrenia:
        - Brilaroxazine lowered climbing scores at all time points across doses with ~5-fold reduction vs apomorphine control
    - Apomorphine-induced prepulse inhibition (PPI) rodent models represent psychotic behaviors, in particular for negative symptoms and cognitive deficits:
        - Significant dose-dependent reversal of PPI deficits with brilaroxazine vs vehicle control at the 3-, 10-, and 30-mg/kg doses
    - NMDA-induced (a surrogate model for dopamine and serotonin systems) rodent models provide overall assessments of symptoms and in particular locomotion for positive symptoms and stereotypy for negative symptoms:
        - Brilaroxazine significantly decreased dizocilpine-induced hyperlocomotion and stereotypy behaviors in a dose-dependent manner across the 3-, 10-, and 30-mg/kg doses
- Preclinical data reinforce the efficacy profile of brilaroxazine seen in the clinical trials Phase 1B in patients with stable schizophrenia, and Phase 2 in patients with acute schizophrenia and schizoaffective disorders.
- Differentiated efficacy demonstrated in patients with schizophrenia possibly attributed to the multimodal effects of brilaroxazine that involves critical dopamine and serotonin targets and influence on pro-inflammatory cytokine release

About Reviva's Lead Drug Candidate Brilaroxazine

Brilaroxazine is a new chemical entity with potent affinity and selectivity against key serotonin and dopamine receptors implicated in schizophrenia and its comorbid symptoms. In a multinational, multicenter, double-blind Phase 2 study in 234 patients with acute schizophrenia or schizoaffective disorder, brilaroxazine met its primary endpoint, reducing Positive and Negative Syndrome Scale (PANSS) total score and demonstrating statistically significant improvement of overall drug treatment outcomes using Clinical Global Impression (CGI) scale and for secondary endpoints evaluating social functioning, and positive and negative symptoms, and directional improvements for depression and cognition. In this completed Phase 2 study, brilaroxazine met all safety endpoints with no weight gain, no increase in blood sugar and lipids, and no cardiac or endocrine adverse effects compared to

placebo. Positive data from a clinical drug-drug interaction (DDI) study investigating the potential effect of CYP3A4 enzyme on brilaroxazine in healthy subjects supports no clinically significant interaction when combined with a CYP3A4 inhibitor. A full battery of regulatory compliant toxicology and safety pharmacology studies has been completed for brilaroxazine. The U.S. Food and Drug Administration (FDA) has agreed to consider a potential superior safety label claim if there is a positive outcome on a relevant endpoint in a pivotal Phase 3 study in patients with schizophrenia. Reviva intends to develop brilaroxazine for other neuropsychiatric indications including bipolar disorder, major depressive disorder (MDD) and attention-deficit/hyperactivity disorder (ADHD).

Additionally, brilaroxazine has shown promising efficacy for pulmonary arterial hypertension (PAH) and idiopathic pulmonary fibrosis (IPF) with mitigation of lung fibrosis and inflammation in translational animal models. Reviva believes brilaroxazine has the potential to delay disease progression in PAH and IPF and intends to develop brilaroxazine for these pulmonary indications. Brilaroxazine has already received Orphan Drug Designation by the U.S. FDA for the treatment of these conditions.

To learn more about the clinical and preclinical data available for brilaroxazine, please visit revivapharma.com/publications.

About Reviva

Reviva is a clinical-stage biopharmaceutical company that discovers, develops, and seeks to commercialize next-generation therapeutics for diseases representing unmet medical needs and burdens to society, patients, and their families. Reviva's current pipeline focuses on the central nervous system, respiratory and metabolic diseases. Reviva's pipeline currently includes two drug candidates, brilaroxazine and RP1208. Both are new chemical entities discovered in-house. Reviva has been granted composition of matter patents for both brilaroxazine and RP1208 in the United States (U.S.), Europe, and several other countries.

Forward-Looking Statements

This press release contains certain forward-looking statements within the meaning of Section 27A of the Securities Act of 1933 and Section 21E of the Securities Exchange Act of 1934 and the Private Securities Litigation Reform Act, as amended, including those relating to the Company's RECOVER Phase 3 trial, including expectations therefor and the timing of topline data, the Company's expectations regarding the anticipated clinical profile of its product candidates, including statements regarding anticipated efficacy profile, product development, clinical and regulatory approval pathways, timelines expenses, market opportunity, ability to raise sufficient funding, competitive position, possible or assumed future results of operations, business strategies, potential growth opportunities and other statements that are predictive in nature. These forward-looking statements are based on current expectations, estimates, forecasts and projections about the industry and markets in which we operate and management's current beliefs and assumptions.

These statements may be identified by the use of forward-looking expressions, including, but not limited to, “expect,” “anticipate,” “intend,” “plan,” “believe,” “estimate,” “potential, “predict,” “project,” “should,” “would” and similar expressions and the negatives of those terms. These statements relate to future events or our financial performance and involve known and unknown risks, uncertainties, and other factors which may cause actual results, performance, or achievements to be materially different from any future results, performance or achievements expressed or implied by the forward-looking statements. Such factors include those set forth in the Company’s most recent Annual Report on Form 10-K for the fiscal year ended December 31, 2022, and the Company’s other filings from time to time with the Securities and Exchange Commission. Prospective investors are cautioned not to place undue reliance on such forward-looking statements, which speak only as of the date of this press release. The Company undertakes no obligation to publicly update any forward-looking statement, whether as a result of new information, future events or otherwise.

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