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Beyond Chemical Reductionism: How New Depression Research Supports Embodied Medicine

Julian Ungar-Sargon, MD, PhD

*Correspondence: Julian Ungar-Sargon

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Abstract

A landmark systematic umbrella review by University College London researchers published in Molecular Psychiatry found no solid scientific evidence supporting the serotonin theory of depression, challenging the foundational "chemical imbalance" hypothesis underlying SSRI treatment and opening new avenues for alternative therapeutic approaches.

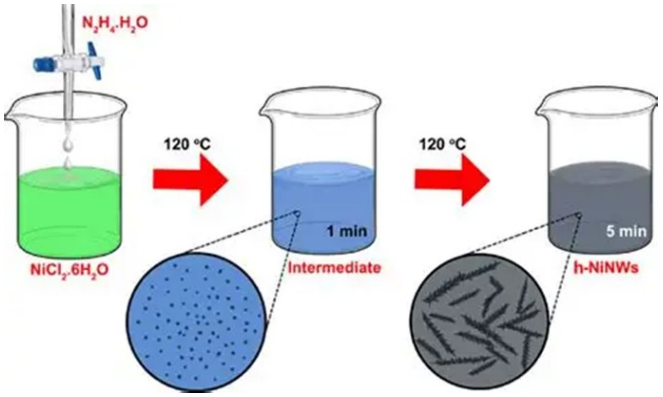
This essay examines how the collapse of the chemical imbalance theory validates embodied medicine approaches to depression that recognize the inseparable unity of mind, body, and environment, moving beyond Cartesian dualism toward holistic healing paradigms.

We synthesize findings from the UCL review with phenomenological research, embodied cognitive science, and integrative healing approaches, drawing particularly on the work of Thomas Fuchs, Kevin Aho, and Julian Ungar-Sargon's critique of reductionist medicine.

The convergence of evidence demonstrates that depression emerges not from isolated neurochemical deficiencies but from disruptions in embodied consciousness, intercorporeality, and the person's dynamic engagement with their world. Phenomenological research reveals depression as involving spatial-temporal disruption, corporeal alienation, and breakdown of meaning-making processes. Body-oriented psychotherapies and embodied interventions show promise as alternatives to purely pharmacological approaches.

Conclusions: The collapse of the serotonin theory represents more than a scientific correction—it signals a paradigm shift toward understanding depression as a meaningful response of embodied persons to life circumstances rather than a brain disease. This supports therapeutic approaches that address the person's total existential situation, restore embodied agency, and honor the sacred dimensions of healing encounters. Future research should focus on developing integrative frameworks that transcend the artificial mind-body split while maintaining scientific rigor.

Keywords: embodied medicine, phenomenology, depression, serotonin theory, holistic healing, intercorporeality, Cartesian dualism, therapeutic encounter, body-oriented psychotherapy.



Historical Development of the Serotonin Hypothesis

The serotonin hypothesis of depression has dominated psychiatric thinking for nearly six decades, fundamentally shaping how both clinicians and the public understand mental illness. First proposed in 1967 by British psychiatrist Alec Coppen, the hypothesis emerged during an era when the biogenic amines-noradrenaline and serotonin (5-hydroxytryptamine, 5-HT)-were newly discovered as brain neurotransmitters (22). The theory was initially formulated around the observation that certain drugs with antidepressant effects, such as monoamine oxidase inhibitors and tricyclic antidepressants, appeared to potentiate serotonin activity at neuronal synapses.

This pattern of theory-making-moving from the pharmacological actions of drugs with therapeutic efficacy to biochemical theories of causation-became common in biological psychiatry (23). However, as Coppen himself cautioned, "the actions of these drugs may merely represent therapeutic manoeuvres which in themselves may be quite unrelated to aetiological factors underlying the majority of cases of depression" (24). Despite this early wisdom, the hypothesis gained momentum through the 1970s and 1980s.

The theory received its most powerful boost with the development of selective serotonin reuptake inhibitors (SSRIs) in the 1980s and their subsequent marketing to both physicians and consumers. The pharmaceutical industry promoted a simplified version of the serotonin hypothesis—the "chemical imbalance" theory—suggesting that depression resulted from insufficient serotonin levels that could be corrected through medication (25). This marketing message proved extraordinarily effective: studies show that 85-90% of the public now believes depression is caused by low serotonin or a chemical imbalance (1).

The Scientific Foundation and Its Erosion

The original scientific evidence for the serotonin hypothesis was circumstantial at best. Early studies relied primarily on the depressogenic effects of amine-depleting agents like reserpine and the apparent efficacy of drugs that enhanced serotonin function. However, direct investigation of neurochemistry in the living human brain was not possible when the theory was first proposed, leading researchers to infer causation from treatment effects—a logically precarious approach (26).

Over the subsequent decades, multiple lines of research attempted to validate the hypothesis. Studies examined serotonin and its metabolite 5-hydroxyindoleacetic acid (5-HIAA) in body fluids, investigated serotonin receptor binding, measured serotonin transporter (SERT) levels through brain imaging and post-mortem studies, conducted tryptophan depletion experiments, and analyzed genetic associations with the serotonin transporter gene (27). Despite this extensive research program, consistent evidence for the serotonin hypothesis remained elusive.

Tryptophan depletion studies—considered among the strongest evidence for serotonin's role in depres-

sion—showed that artificially lowering brain serotonin levels through dietary manipulation produced depressive symptoms primarily in individuals with a history of depression, not in healthy volunteers (28). Even this evidence was limited, involving small sample sizes and inconsistent findings. Large-scale genetic studies involving tens of thousands of participants found no differences in serotonin transporter genes between people with depression and healthy controls (29).

Perhaps most significantly, the famous 2003 study by Caspi and colleagues, which appeared to demonstrate an interaction between the serotonin transporter gene, stressful life events, and depression risk, was subsequently debunked by larger, more comprehensive analyses (30). These more robust studies revealed that while stressful life events strongly predicted depression risk, genetic variations in serotonin function did not.

The Marketing of a Myth

The persistence of the serotonin hypothesis despite weak scientific support reflects what David Healy described as "the marketing of a myth" (31). Pharmaceutical companies promoted the chemical imbalance theory not because of strong scientific evidence, but because it provided a compelling narrative to justify medication use and overcome public reluctance to take psychoactive drugs (32). The U.S. Food and Drug Administration approved marketing claims that depression "may be due to a serotonin deficiency" and that SSRIs work by helping to "restore the brain's chemical balance"—claims that were scientifically meaningless, as there is no established normal "balance" of serotonin (33).

This marketing succeeded beyond its creators' wildest expectations. Prescriptions for antidepressants rose dramatically from the 1990s onward, with one in six adults in England and 2% of teenagers now prescribed antidepressants annually (1). The chemical imbalance theory became folk wisdom, embedded in textbooks, clinical practice, and popular understanding of mental health.

A Definitive Challenge to Chemical Reductionism

The 2022 systematic umbrella review by Moncrieff and colleagues represents the most comprehensive and methodologically rigorous examination of the serotonin hypothesis of depression ever undertaken (1). Published in *Molecular Psychiatry*, this landmark study employed the highest level of evidence synthesis available—an umbrella review of systematic reviews and meta-analyses—to address the fundamental question: Is depression associated with lowered serotonin concentration or activity?

Comprehensive Methodology and Scope

The researchers conducted an exhaustive search across six key areas of serotonin research, each addressing different aspects of the chemical imbalance theory: (1) serotonin and its metabolite 5-HIAA levels in body fluids; (2) serotonin receptor alterations; (3) serotonin transporter (SERT) levels; (4) tryptophan depletion studies; (5) SERT gene associations; and (6) gene-environment interactions between the SERT gene and stress. This systematic approach was designed to capture all major lines of evidence that have been used to support the serotonin theory over the past six decades.

Searching PubMed, EMBASE, and PsycINFO databases from inception through December 2020, the team identified 361 potentially relevant publications. After rigorous screening, they included 17 high-quality studies comprising 12 systematic re-

views and meta-analyses, one collaborative meta-analysis, one meta-analysis of large cohort studies, one systematic review with narrative synthesis, one genetic association study, and one umbrella review. Notably, they also included large genetic studies that captured more individuals than entire meta-analyses, providing even more reliable evidence than traditional systematic reviews.

Systematic Quality Assessment

The research team employed multiple validated tools for quality assessment, including AMSTAR-2 for systematic reviews, a modified AMSTAR-2 for non-conventional studies, and STREGA criteria for genetic association studies. They also implemented a modified GRADE approach to assess the certainty of evidence, prioritizing factors such as sample size, unified analysis of original data, control for antidepressant confounding, pre-specification of outcomes, consistency of results, and likelihood of publication bias.

The quality assessment revealed significant limitations in much of the existing literature: only 31% of included reviews adequately assessed risk of bias in individual studies, and only 50% properly accounted for this bias in their interpretations. Most concerning was the frequent failure to control for the confounding effects of antidepressant medication—a critical oversight that potentially invalidates many positive findings in the literature.

Definitive Negative Findings Across All Research Areas

The umbrella review's findings were unambiguous and consistent across all areas of investigation:

Serotonin and Metabolite Levels: Three studies examining serotonin and its primary metabolite 5-HIAA in body fluids found no evidence of reduced levels in depression. A meta-analysis of plasma serotonin in 1,869 post-menopausal women showed no significant association with depression after multiple comparison correction. Most tellingly, this study found that antidepressant use itself was strongly associated with lower serotonin levels, suggesting that any observed reductions might be iatrogenic rather than causative.

Receptor Studies: Two meta-analyses of 5-HT1A receptor binding (the most studied serotonin receptor in depression) found either no differences between depressed and healthy individuals or paradoxically lower levels of these inhibitory receptors in depression. Lower levels of inhibitory 5-HT1A receptors would theoretically increase rather than decrease serotonin activity, contradicting the deficiency hypothesis.

Serotonin Transporter: Three overlapping meta-analyses of SERT binding potential, involving 40 individual studies and 1,845 participants, showed weak and inconsistent evidence of reduced transporter binding in some brain regions. However, reduced SERT binding would indicate higher synaptic serotonin availability—again contradicting rather than supporting the serotonin deficiency theory. Moreover, these findings could not reliably exclude the effects of prior antidepressant use.

Tryptophan Depletion: Studies using acute tryptophan depletion to lower brain serotonin showed no consistent mood effects in healthy volunteers (n=566). Only in a small subgroup of individuals with family history of depression (n=75) was there weak evidence of mood reduction, but this involved very small numbers and within-subject study designs of questionable reliability. The researchers' analysis of ten recent studies confirmed these null

findings.

Genetic Evidence: The two largest and highest-quality genetic studies—a genetic association study of 115,257 individuals and a collaborative meta-analysis of 43,165 participants—found no evidence of association between SERT gene polymorphisms and depression. Crucially, these studies also found no evidence for the widely cited gene-environment interaction between serotonin transporter gene variants and stressful life events, effectively debunking one of the most influential findings in depression genetics.

Perhaps the most striking finding was evidence that long-term antidepressant use may actually reduce serotonin concentrations. This counterintuitive discovery suggests that SSRIs may produce therapeutic effects through mechanisms entirely unrelated to correcting serotonin deficiency. The researchers noted that "some evidence was consistent with the possibility that long-term antidepressant use reduces serotonin concentration," citing both human studies showing reduced plasma serotonin with antidepressant use and animal studies demonstrating decreased serotonin availability following prolonged SSRI administration.

Implications for Understanding Depression

The comprehensive negative findings of the Moncrieff review create profound implications for how we conceptualize depression and mental health more broadly. By systematically dismantling the biochemical foundation that has justified reductionist approaches to depression for six decades, this research opens conceptual space for understanding depression as an embodied phenomenon that emerges from the person's total existential situation rather than isolated neurochemical dysfunction.

The researchers explicitly acknowledge that their findings challenge not just scientific theory but deeply entrenched public beliefs: "Surveys suggest that 80% or more of the general public now believe it is established that depression is caused by a 'chemical imbalance'... This belief shapes how people understand their moods, leading to a pessimistic outlook on the outcome of depression and negative expectancies about the possibility of self-regulation of mood." This observation aligns perfectly with embodied medicine's concern that reductionist explanations diminish human agency and obscure the relational, environmental, and experiential dimensions where healing actually occurs.

Methodological Rigor and Scientific Controversy

The study's methodological rigor is reflected in its unprecedented impact: downloaded over one million times and generating responses from 36 experts in a subsequent commentary. Critics have argued that the review used unconventional inclusion criteria and that the serotonin theory was never meant to be simplistic. However, supporters contend that such criticisms miss the fundamental point: the gap between scientific evidence and public messaging has created a therapeutic mythology that constrains rather than expands healing possibilities.

The researchers' conclusion is definitive: "Our comprehensive review of the major strands of research on serotonin shows there is no convincing evidence that depression is associated with, or caused by, lower serotonin concentrations or activity... We suggest it is time to acknowledge that the serotonin theory of depression is not empirically substantiated."

Paradigmatic Implications for Embodied Medicine

This systematic demolition of the serotonin hypothesis creates an unprecedented opportunity for paradigmatic shift toward embodied understandings of mental health. As Ungar-Sargon argues in his critique of Cartesian medicine, the chemical imbalance theory represents precisely the kind of "worn out philosophical idea" that perpetuates artificial mind-body dualism (2). The collapse of serotonin reductionism validates his call for healing approaches that recognize the "essential unity of mind, body, and spirit" and address the person's total existential situation rather than isolated biological abnormalities.

The Moncrieff findings align with embodied medicine's core insight that depression emerges from disrupted relationships—to self, others, environment, and meaning—rather than from defective neurochemistry. This shift from mechanism to meaning, from isolated brain dysfunction to embodied existential distress, provides the scientific foundation for therapeutic approaches that honor human complexity and agency while addressing the full spectrum of factors that contribute to psychological suffering.

Implications for Understanding Depression

The collapse of the serotonin theory represents more than just a scientific correction—it signals the potential end of a fundamentally reductionist approach to mental health that has dominated psychiatry for decades. By finding no solid evidence for the chemical imbalance theory that underlies SSRI treatment, this research opens space for more holistic, embodied understandings of psychological distress that recognize the inseparable unity of mind, body, and environment. ### Serotonin Biochemistry and the Complexity of Neurotransmitter Systems

Understanding the biochemical basis of serotonin function reveals the oversimplification inherent in the "chemical imbalance" theory. Serotonin (5-hydroxytryptamine, 5-HT) is synthesized from the essential amino acid L-tryptophan through a two-step enzymatic pathway (36). The rate-limiting step involves tryptophan hydroxylase (TPH), which converts tryptophan to 5-hydroxytryptophan (5-HTP), followed by aromatic amino acid decarboxylase (DDC) converting 5-HTP to serotonin (37). This synthesis occurs primarily in two distinct locations: serotonergic neurons in the central nervous system and enterochromaffin cells in the gastrointestinal tract, where approximately 90% of the body's serotonin is actually produced (38).

The complexity of serotonin function extends far beyond simple concentration levels. Serotonin acts through at least 14 different receptor subtypes (5-HT1A through 5-HT7), each mediating distinct physiological and behavioral effects (39). These receptors function as either G-protein coupled receptors or ligand-gated ion channels, activating diverse intracellular signaling cascades that can produce either excitatory or inhibitory responses (40). This receptor diversity explains why measuring total serotonin levels provides little meaningful information about its functional activity in different brain regions or physiological contexts.

Serotonin metabolism involves oxidation by monoamine oxidase (MAO) to 5-hydroxyindoleacetaldehyde, followed by conversion to 5-hydroxyindoleacetic acid (5-HIAA), the major metabolite excreted in urine (41). Importantly, serotonin cannot cross the blood-brain barrier,

meaning central and peripheral serotonin systems operate independently. This separation has profound implications for understanding depression, as peripheral measures of serotonin or its metabolites may not reflect central nervous system activity (42).

The Competing Kynurenine Pathway: Alternative Tryptophan Metabolism

A crucial aspect overlooked by the simple serotonin hypothesis is the competing kynurenine pathway, which metabolizes approximately 95% of dietary tryptophan—far more than the small fraction used for serotonin synthesis (43). This pathway is activated by inflammatory cytokines through the enzymes indoleamine 2,3-dioxygenase (IDO) and tryptophan 2,3-dioxygenase (TDO), converting tryptophan to kynurenine and subsequently to various metabolites including quinolinic acid and kynurenic acid (44).

During immune activation or chronic stress, increased kynurenine pathway activity reduces tryptophan availability for serotonin synthesis while producing potentially neurotoxic metabolites like quinolinic acid, which can activate NMDA receptors and promote neuroinflammation (45). This mechanism may explain why inflammatory conditions are associated with depression, suggesting that the relationship between tryptophan metabolism and mood involves complex interactions between immune function, stress response, and neurotransmitter availability rather than simple serotonin deficiency (46).

Comparative Mechanisms of Antidepressant Drug Classes

The diversity of effective antidepressant mechanisms challenges the primacy of serotonin in depression treatment. While selective serotonin reuptake inhibitors (SSRIs) specifically block serotonin reuptake transporters to increase synaptic serotonin availability, other equally effective classes operate through different mechanisms (47).

Tricyclic Antidepressants (TCAs), the predecessors to SSRIs, block reuptake of both serotonin and norepinephrine, but also affect multiple other neurotransmitter systems including histamine, acetylcholine, and dopamine receptors (48). Despite their broader mechanism of action and more extensive side effect profile, TCAs demonstrate equivalent or sometimes superior efficacy to SSRIs, particularly in severe depression (49). The fact that drugs with such different receptor profiles achieve similar therapeutic outcomes suggests that depression involves multiple neurotransmitter systems rather than isolated serotonin dysfunction.

Monoamine Oxidase Inhibitors (MAOIs) operate through an entirely different mechanism, inhibiting the enzyme responsible for breaking down serotonin, norepinephrine, and dopamine, thereby increasing levels of all three neurotransmitters (50). Unlike SSRIs or SNRIs, MAOIs significantly elevate dopamine levels, which may contribute to their particular effectiveness in atypical depression characterized by energy loss and anhedonia (51). The success of MAOIs in treatment-resistant cases further challenges the specificity of serotonin-focused theories.

Atypical Antidepressants demonstrate the most dramatic departure from serotonin-centric mechanisms. Bupropion (Wellbutrin) primarily affects dopamine and norepinephrine reuptake with minimal serotonin activity, yet remains highly effective for depression (52). Mirtazapine (Remeron) works

as a noradrenergic and specific serotonergic antidepressant (NaSSA), blocking specific serotonin receptor subtypes while enhancing norepinephrine release (53). Perhaps most tellingly, tianeptine actually enhances serotonin reuptake—the opposite of SSRIs—yet demonstrates antidepressant efficacy, directly contradicting simple serotonin deficiency models (54).

The Paradox of Temporal Dissociation

A fundamental problem with serotonin-based theories lies in the temporal dissociation between biochemical and therapeutic effects. SSRIs increase synaptic serotonin concentrations within hours of administration, yet therapeutic benefits typically require weeks to months to manifest (55). This delay suggests that acute neurotransmitter changes are not the primary mechanism of therapeutic action, but rather trigger downstream adaptive processes that may involve neuroplasticity, gene expression changes, or neurogenesis (56).

Recent research indicates that antidepressants may work primarily through their effects on brain-derived neurotrophic factor (BDNF), neurogenesis in the hippocampus, or modifications of hypothalamic-pituitary-adrenal axis function rather than through direct neurotransmitter effects (57). These mechanisms involve complex cascades of cellular and molecular changes that develop over weeks, explaining both the delayed onset of therapeutic effects and why drugs with diverse acute pharmacological profiles can achieve similar long-term outcomes.

Implications for Embodied Understanding

The biochemical complexity of serotonin function and the diversity of effective antidepressant mechanisms support embodied approaches that view depression as emerging from disrupted systems rather than isolated chemical deficiencies. The extensive peripheral serotonin system, particularly in the gastrointestinal tract, highlights the importance of gut-brain interactions and the embodied nature of mood regulation (58). The competing kynurenine pathway connects depression to immune function, stress response, and inflammatory processes—all fundamentally embodied phenomena that cannot be reduced to brain chemistry alone.

This complexity suggests that therapeutic interventions should address the whole person rather than targeting isolated neurotransmitter systems. The fact that drugs with entirely different mechanisms can achieve similar therapeutic outcomes indicates that depression represents a final common pathway of distress that can be reached through multiple biological, psychological, and social routes—supporting the embodied medicine perspective that healing requires attention to the person's total existential situation rather than correction of presumed chemical abnormalities.

The chemical imbalance theory exemplifies what embodied medicine scholars have long critiqued: the artificial separation of mental experience from lived, bodily reality. This reductionist framework treats depression as a malfunction of brain chemistry, divorced from the person's relationships, trauma history, social context, and embodied experiences of the world. As Ungar-Sargon argues in his work on "the sacred dimensions of medical practice," modern healthcare increasingly operates within a paradigm of scientific reductionism that can inadvertently reduce patients to collections of symptoms and laboratory values (3). The UCL findings suggest this mechanistic view may be not only incomplete but fundamentally misguided.

Embodiment vs. Neurochemical Reductionism

Embodied approaches to medicine recognize that human experience is always *embodied experience*—we do not simply *have* bodies that occasionally malfunction, but rather *are* embodied beings whose psychological states emerge from our dynamic engagement with the world. Depression, from this perspective, is not a chemical deficiency to be corrected but a meaningful response of the whole person to their lived circumstances.

As Ungar-Sargon argues in his comprehensive critique of contemporary medical practice, "worn out philosophical ideas still pervade the practice of medicine: the Cartesian split lives on" (2). This observation is particularly acute in the realm of molecular psychiatry, where the serotonin hypothesis represents the apotheosis of reductionist thinking that artificially separates mind from body, person from environment, and meaning from mechanism. The chemical imbalance theory exemplifies what Ungar-Sargon identifies as the fundamental problem with modern medical practice: the reduction of human suffering to isolated biological malfunctions divorced from the person's relationships, trauma history, social context, and embodied experiences of the world.

Molecular Psychiatry as Cartesian Extremism

The molecular psychiatric approach to depression represents an extreme manifestation of Cartesian dualism, where the mind is reduced to brain chemistry and psychological suffering becomes merely a matter of defective neurotransmitter function. This reductionist framework not only fails to capture the complexity of human experience but actively obscures it by directing attention away from the relational, environmental, and existential dimensions where healing often occurs.

In his analysis of "archetypal and embodied approaches to medical practice," Ungar-Sargon demonstrates how both Jung's archetypal medicine and embodied medicine converge in their critique of "the mechanistic reductionism of modern medicine while proposing alternative frameworks for understanding illness, healing, and the therapeutic relationship" (79). This convergence reveals that the problem with molecular psychiatry extends beyond simple methodological limitations—it represents a fundamental philosophical error that treats persons as biological machines rather than as embodied beings engaged in meaningful relationships with their world.

The serotonin theory epitomizes this mechanistic reductionism by proposing that the profound existential reality of depression—with its disruptions of meaning, relationship, temporality, and embodied agency—can be understood and treated through the manipulation of a single neurotransmitter system. This approach not only fails empirically, as demonstrated by the Moncrieff review, but also fails phenomenologically by ignoring what Ungar-Sargon describes as the "essential unity of mind, body, and spirit" that characterizes authentic human existence (3).

The Sacred-Profane Dialectic

Ungar-Sargon's theological and healing essays reveal how molecular psychiatry's reductionism violates what he terms the "sacred-profane dialectic inherent in therapeutic encounters" (20). By reducing depression to neurochemical dysfunction, molecular psychiatry strips the therapeutic encounter of its sacred dimensions, transforming what should be a profound meeting between persons into a technical intervention targeting isolated biological systems.

In his work on "Sacred and Profane Space in the Therapeutic Encounter," Ungar-Sargon argues that authentic healing emerges from recognizing "the therapeutic space [as] a contemporary locus of divine indwelling" where both healer and patient encounter the mystery of human suffering and transformation (20). This understanding stands in stark contrast to molecular psychiatry's mechanistic framework, which treats the therapeutic relationship as merely a vehicle for delivering pharmacological interventions rather than as itself a source of healing power.

The chemical imbalance theory not only reduces the patient to a collection of symptoms and laboratory values but also reduces the physician to a technician whose primary function is to identify and correct biological abnormalities. This dual reduction violates what Ungar-Sargon describes as the fundamental requirement that healing approaches must "honor the full personhood of patients" and recognize the physician-patient relationship as "a space of 'dialectical presence' where healer and patient encounter mystery together" (21).

From Objective Evidence to Sacred Text

Ungar-Sargon's essay on "Hermeneutic Approaches to Medicine: From Objective Evidence to Patient as Sacred Text" provides a particularly powerful critique of molecular psychiatry's epistemological assumptions (18). While molecular psychiatry treats depression as an objective phenomenon to be measured and manipulated through standardized interventions, hermeneutic medicine recognizes that understanding psychological suffering requires interpretive engagement with the patient's lived experience as a "sacred text" requiring careful reading and interpretation.

This hermeneutic approach acknowledges that depression is not simply a collection of symptoms to be eliminated but a meaningful communication about the person's way of being in the world. The patient's suffering speaks—it tells a story about disrupted relationships, blocked possibilities, existential threats, and the search for meaning. Molecular psychiatry's focus on serotonin levels renders this communication invisible, reducing the rich complexity of human suffering to neurochemical signals that can be "corrected" through pharmaceutical intervention.

The hermeneutic perspective reveals how molecular psychiatry's emphasis on "objective evidence" actually obscures rather than illuminates the nature of depression. By privileging laboratory values and brain imaging over the patient's lived experience, molecular psychiatry commits what Ungar-Sargon identifies as a fundamental category error: treating the person's story as mere epiphenomenon of underlying biological processes rather than as the primary datum requiring therapeutic attention.

Convalescence and the Temporality of Healing

Ungar-Sargon's analysis of "What Happened to Convalescence?" provides another crucial critique of molecular psychiatry's reductionist approach (14). The concept of convalescence—the gradual process of recovery that requires time, rest, and careful attention to the rhythms of healing—has been largely eliminated from modern medical practice in favor of rapid pharmaceutical interventions designed to eliminate symptoms as quickly as possible.

This elimination of convalescence reflects molecular psychiatry's mechanistic understanding of healing as the correction of defective parts rather than

the restoration of embodied wholeness. The serotonin hypothesis suggests that depression can be "fixed" by adjusting neurotransmitter levels, much like adjusting the carburetor on an automobile. This mechanical model ignores what Ungar-Sargon describes as the fundamentally temporal nature of authentic healing, which requires not just the elimination of symptoms but the reconstruction of meaning, the restoration of relationships, and the reintegration of the person's embodied capacities for engagement with the world.

The temporal dimension is particularly important because, as phenomenological research demonstrates, depression involves fundamental disruptions of lived temporality—the loss of future possibility, the weight of an unchangeable past, and the stagnation of the present moment. Healing these temporal disruptions cannot be accomplished through neurochemical manipulation alone but requires what Ungar-Sargon calls "deep listening" and sustained therapeutic presence that honors the natural rhythms of recovery and transformation.

The Military Model and Medical Violence

In his critique of the "military model of medicine," Ungar-Sargon reveals how molecular psychiatry's approach to depression reflects broader problematic assumptions about medical intervention as warfare against disease (18). The language of "fighting" depression, "targeting" neurotransmitter systems, and "defeating" mental illness reveals an underlying militaristic mentality that treats the person's suffering as an enemy to be destroyed rather than as a meaningful communication requiring understanding and response.

This military model is particularly destructive in the context of depression because it positions the person against their own experience, encouraging them to view their psychological suffering as an alien invasion to be repelled rather than as a potentially meaningful response to their life circumstances. The chemical imbalance theory reinforces this alienation by suggesting that depression is not really "theirs" but rather the result of malfunctioning brain chemistry that can be corrected through external intervention.

Ungar-Sargon's alternative vision emphasizes healing paradigms that integrate "music and spirituality" and focus on "understanding the patient as a person in process" rather than as a battlefield where chemical warfare is conducted against defective neurotransmitter systems (11). This approach recognizes that authentic healing requires the person's active participation and agency rather than passive submission to pharmaceutical correction of presumed biological abnormalities.

Embodied Resistance to Molecular Reductionism

The embodied medicine framework that Ungar-Sargon advocates provides a comprehensive alternative to molecular psychiatry's reductionist approach. Rather than treating depression as neurochemical dysfunction, embodied medicine recognizes it as a meaningful disruption of the person's embodied engagement with their world—including their relationships, their environment, their sense of agency and possibility, and their connection to sources of meaning and value.

This embodied understanding suggests that healing requires not the correction of isolated biological abnormalities but the restoration of the person's embodied capacities for meaningful engagement with life. This might involve addressing trauma that has

become stored in the body, rebuilding relationships that provide social support and connection, engaging in practices that restore the person's sense of agency and efficacy, or reconnecting with sources of meaning and transcendence that provide hope and direction.

The embodied approach also recognizes what Ungar-Sargon describes as the importance of addressing "the limitations of reductionist approaches to healing" by developing "a practical manifestation of a holistic healing philosophy" that integrates biological, psychological, social, and spiritual dimensions of human experience (21). This integration is not merely additive—it recognizes that these dimensions are fundamentally interconnected and that interventions in any one area will necessarily affect the others.

Divine Presence and Concealment in Depression

Ungar-Sargon's theological essays provide a particularly profound critique of molecular psychiatry's inability to engage with the spiritual dimensions of depression. In his work on "Divine Presence and Concealment in the Therapeutic Space," he argues that depression often involves what can be understood theologically as experiences of divine concealment—the sense that meaning, hope, and connection have been withdrawn from the world (20).

This theological understanding recognizes that depression is not simply a medical condition but a profound spiritual crisis that involves questions of ultimate meaning, purpose, and value. The person experiencing depression is not merely suffering from defective neurotransmitter function but is grappling with fundamental questions about the nature of existence, the possibility of hope, and the availability of love and connection in a world that may seem empty and meaningless.

Molecular psychiatry's focus on serotonin levels cannot address these existential and spiritual dimensions of depression because it lacks the conceptual resources to engage with questions of meaning, value, and transcendence. By reducing depression to neurochemical dysfunction, molecular psychiatry not only fails to provide adequate treatment but actually compounds the person's suffering by reinforcing their sense that their experience is meaningless and their agency is irrelevant.

Toward Integration

The convergence of the UCL research findings with embodied medicine approaches suggests that we are witnessing a paradigm shift away from molecular reductionism toward more integrative understandings of mental health. This shift represents not just a scientific correction but a philosophical and theological recovery of recognition that human beings are not isolated biological machines but embodied persons embedded in webs of relationship and meaning.

Ungar-Sargon's vision of healing that addresses "the essential unity of mind, body, and spirit while creating spaces for therapeutic encounters that honor the full personhood of patients" provides a framework for moving beyond molecular psychiatry's Cartesian limitations toward approaches that can engage with the full complexity and mystery of human suffering and healing (16). This integration does not reject biological insights but places them within a larger context that recognizes the person's embodied existence in relationship with others, with their environment, and with sources of transcendent meaning and value.

This understanding finds strong support in the phenomenological tradition, particularly in the work of Thomas Fuchs, whose comprehensive research demonstrates that depression involves a fundamental disruption of embodied consciousness, where "the body may regain its pure materiality and turn into an obstacle" in what he describes as a "reification or corporealization of the lived body" (4). Fuchs's concept of "intercorporeality and interaffectivity" positions depression as a disorder of our embodied capacity to participate in shared affective spaces, rather than simply a brain malfunction (5).

The UCL research aligns with this view by highlighting how the chemical theory may actually *discourage hope for recovery* and limit consideration of "non-drug treatment options, such as therapy, lifestyle changes, and social support" (1). This suggests that reductionist explanations don't merely fail to capture the full picture—they actively constrain therapeutic possibilities by directing attention away from the relational, environmental, and experiential dimensions where healing often occurs.

When we understand depression through an embodied lens, we see it as emerging from the person's total situation: their relationships, their sense of agency and meaning, their social circumstances, their trauma history, and their felt sense of being in the world. The body is not a separate biological machine but the very medium through which these experiences are lived and expressed.

The Phenomenology of Distress

The researchers' call to focus more on "life stressors, trauma, and socio-environmental factors" resonates with a growing body of phenomenological research that takes seriously the lived experience of depression (1). Rather than reducing distress to aberrant neurotransmitter levels, embodied medicine asks: What is this person's depression telling us about their way of being in the world?

Kevin Aho's phenomenological analysis reveals that depression disrupts "everyday experiences of spatial orientation and motility" and creates "a situational atmosphere of emotional indifference that reduces the person's ability to qualitatively distinguish what matters" (6). This disruption, he argues, is not directed toward particular objects but toward "the world as a whole"—a finding that supports viewing depression as an embodied disorder of being-in-the-world rather than a neurochemical malfunction.

Recent research further corroborates this embodied understanding. Studies examining "depression as an embodied phenomenon" reveal "an embodied process of an ambiguous striving against fading," with subthemes including "feeling estranged, feeling confined, feeling burdensome, sensing life and seeking belongingness" (7). This research suggests that therapeutic interventions should focus on "enhancing the enabling dimensions, for example through guided physical activities to support the patient to feel more alive, capable and connected."

Importantly, research on "depression as an embodied experience" demonstrates that "participants make sense of depression through their bodies, as a painful, uncomfortable and agonising experience" and that "the body mediates meaning-making and identity processes" (8). These findings directly challenge the chemical imbalance model by showing that depression is fundamentally about how people experience and interpret their embodied ex-

istence, not simply about neurotransmitter deficiencies.

Therapeutic Implications and Embodied Interventions

The UCL findings support therapeutic approaches that work with the whole person rather than targeting isolated biological systems. Embodied therapeutic modalities—from somatic experiencing to mindfulness-based interventions to trauma-informed care—recognize that healing happens through restored connection: to one's body, to others, to meaning, and to agency.

Research on Body-Oriented Psychotherapy (BPT) demonstrates how "working with the pre-reflective and embodied level of experiences" through "nonverbal techniques to work with bodily resonances, body memory, and embodied affectivity" offers promising alternatives to purely cognitive or pharmaceutical approaches (9). These "bottom-up treatment methods" work with "the pre-reflective dynamics of bodily movements and affect" through therapeutic modalities including "yoga, music, dance, and movement therapies" (10).

This aligns with Ungar-Sargon's vision of healing paradigms that integrate "music and spirituality" and emphasize "deep listening, convalescence" and "understanding the patient as a person in process" (11). His proposed therapeutic frameworks recognize the need to move beyond the military model of medicine toward approaches that honor the full personhood of patients.

The concerning finding that SSRIs may actually reduce serotonin over time suggests that any benefits likely come through more complex, embodied processes of adaptation and meaning-making rather than through correcting supposed deficiencies (1). This supports Fuchs's argument that mental disorders should be understood as "circular processes" involving "vertical circularity" (between biological and psychological levels) and "horizontal circularity" (between person and environment) (12).

The Role of Temporality and Rhythm

Perhaps most importantly, moving beyond chemical reductionism reclaims human agency in the face of psychological distress. The chemical imbalance theory, as the researchers note, may discourage hope by suggesting depression is simply a biological malfunction beyond personal influence (1). Embodied approaches, by contrast, recognize that while we may not control our circumstances, we retain capacity for response, adaptation, and growth.

Fuchs's research on temporality in psychopathology reveals that "depression is mostly triggered by a desynchronisation from the social environment and further develops into an inhibition of the conative–affective dynamics of life" (13). This temporal understanding suggests that healing involves restoring natural rhythms and cyclical patterns rather than simply correcting chemical imbalances.

This temporal dimension connects with Ungar-Sargon's work on convalescence as a forgotten aspect of healing—the recognition that recovery requires time, rest, and gradual restoration rather than simply the elimination of symptoms (14). His critique of modern medicine's loss of convalescence as a concept parallels the UCL findings that challenge quick pharmacological fixes in favor of more comprehensive, time-sensitive approaches to healing.

The Ecological Brain and Relational Medicine

Thomas Fuchs's concept of the "ecological brain"

provides a crucial framework for understanding the implications of the UCL research (15). Rather than viewing the brain as "a control center," Fuchs argues it functions as "an organ of resonance and relations" embedded within the larger ecology of the lived body and its environmental relationships. This perspective suggests that depression emerges not from isolated brain chemistry but from disruptions in the complex web of biological, psychological, social, and environmental interactions that constitute human existence.

This ecological understanding supports what Ungar-Sargon describes as a healing paradigm that recognizes the "essential unity of mind, body, and spirit while creating spaces for therapeutic encounters that honor the full personhood of patients" (16). Such approaches transcend traditional biomedical paradigms by addressing the fundamental interconnectedness of human experience.

Research on embodied cognition and emotional disorders suggests that "simulation may serve as a useful heuristic framework" for understanding how "behavioral and emotional change might be brought about by changing the level of abstraction at which people process material" (17). This supports therapeutic approaches that work with embodied processes rather than targeting isolated neurochemical systems.

A New Paradigm for Mental Health

The UCL research creates an opening for more integrative approaches that honor both biological and experiential dimensions of human distress without reducing one to the other. An embodied understanding suggests that psychological symptoms always emerge from the dynamic interaction between the person and their world—including their social relationships, cultural context, physical environment, and life history.

This perspective doesn't reject biological interventions categorically but places them within a broader framework that prioritizes the restoration of embodied agency, meaningful connection, and environmental support. As Ungar-Sargon argues in his comprehensive analysis of healing paradigms, authentic healing requires "economic restructuring of healthcare" and therapeutic approaches that address "the limitations of reductionist approaches to healing" (18).

The convergence of the UCL findings with phenomenological research, embodied cognitive science, and integrative healing approaches suggests that we are witnessing a paradigm shift in our understanding of depression. Rather than viewing it as a brain disease requiring pharmacological correction, we can understand depression as a meaningful—if painful—response of embodied persons to disruptions in their fundamental capacity to engage with the world and others.

Conclusion: Defending Human Complexity

The collapse of the serotonin theory of depression, as documented in the UCL review, opens space for approaches that take seriously the embodied, relational, and contextual nature of human psychological experience (1). This aligns with Fuchs's broader project of "defending the human being" against reductionist accounts that threaten to reduce persons to mere biological machines or collections of symptoms (19).

As Ungar-Sargon argues in his theological and healing essays, authentic healing emerges from recognizing the "sacred-profane dialectic inherent in

therapeutic encounters" and understanding that "the therapeutic space emerges as a contemporary locus of divine indwelling" (20). This sacred dimension of healing cannot be captured by purely mechanistic explanations but requires recognition of the full mystery and complexity of human existence.

Rather than treating depression as a brain disease, we can understand it as a meaningful—if painful—response of embodied persons to their lived circumstances. This shift from mechanism to meaning, from reduction to integration, from treatment to healing, aligns with embodied medicine's recognition that we are not minds trapped in malfunctioning bodies but embodied beings whose wellness emerges from our dynamic engagement with the world.

The research suggests that our most effective responses to depression may lie not in correcting chemical imbalances but in addressing the life circumstances, relationships, environmental factors, and existential dimensions that give rise to psychological distress in the first place. This requires what Ungar-Sargon calls "a practical manifestation of a holistic healing philosophy, offering a template for healthcare delivery that addresses the limitations of reductionist approaches to healing" (21).

Ultimately, the UCL findings validate what embodied medicine practitioners have long known: healing happens not through the correction of isolated biological defects but through the restoration of the complex web of relationships—to self, others, environment, and meaning—that constitute human flourishing. The collapse of the chemical imbalance theory thus represents not just a scientific correction but an invitation to rediscover the profound interconnectedness and sacred mystery of human existence.

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