Investigating the Effects of T-Consciousness Fields on Growth and Metabolic Activity of *Escherichia coli* by Respiration Activity Monitoring System (RAMOS)

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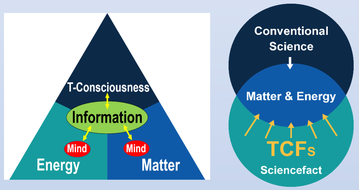
T-Consciousness Fields (TCFs)

In the 1980s, Mohammad Ali Taheri introduced novel fields with non-material/non-energetic nature named Taheri Consciousness Fields (TCFs). In this perspective, T-Consciousness is one of the three existing elements of the universe apart from matter and energy. According to this theory, there are various TCFs with different functions, which are the subcategories of a networked universal internet called the Cosmic Consciousness Network (CCN) [1].



The relationship between T-Consciousness, information, Mind-of-Matter, and Mind-of-Energy and Sciencefact, in relation with conventional science.

Moreover, Taheri introduced Sciencefact in 2020 as a new science which utilizes scientific methods to investigate the existence of TCFs. Sciencefact has provided a common ground between the world of matter/energy and the non-matte/non-energy by facilitating the conduction of reproducible laboratory experiments in various fields of science and has used the scientific approach in proving the existence of the TCFs.

RAMOS and Entropy

Respiration Activity Monitoring System (RAMOS) is a technology for online measurements of respiration activity parameters such as oxygen transfer rate (OTR), carbon dioxide transfer rate (CTR) and respiratory quotient (RQ) in shaking flasks [2].

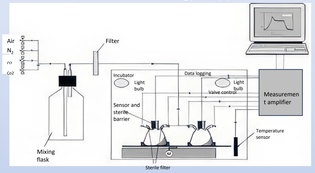
Entropy and Life: The principle of entropy has been applied to describe various biological processes including the evolution of organisms. While entropy is commonly associated with the measurement of disorder, the observed biological order over time may be interpreted as a violation of the second law of thermodynamics [3].

Material and Methods

- The cultivation of *Escherichia coli BL21* was carried out in shaken flasks of 500 ml with a filling volume of 250 ml, at 37 °C, a shaking frequency of 200 rpm and a shaking diameter of d_0= 50 mm.
- **Respiration Activity Monitoring System (RAMOS) method**: There were four Erlenmeyer flasks in parallel including two controls (without TCFs treatment) and two TCF-treated samples. The flasks of controls and treated samples were screened in parallel every 30 minutes for 24 hours, and data were obtained at 46-time points.

$$OTR = \frac{\Delta p_{O_2}}{\Delta t}\frac{V_G}{RTV_L} \qquad CTR = \frac{\Delta p_{CO_2}}{\Delta t}\frac{V_G}{RTV_L} \qquad RQ = \frac{CTR}{OTR}$$

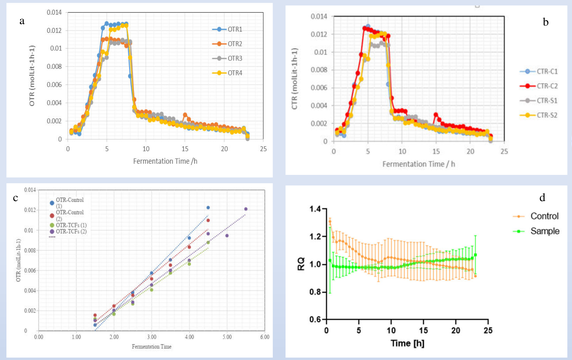
T: temperature (K)- VG: gas volume (l)- VL: liquid volume (l)- ΔpO2: difference of oxygen partial pressure (bar)- ΔpCO2: difference of carbon dioxide partial pressure (bar)- t: time of the measuring phase (h).



Schematic representation of a RAMOS system [4].

Goal of study

This study was conducted to provide information about the influence of TCFs on the bacterial growth cycle, specifically the metabolic activity of *E.coli* BL21 screened by the use of the RAMOS method within 24 hours.



The comparison between (a) OTR, (b) CTR, (c) slopes of OTR rates during logarithmic growth phase of fermentation and (d) respiratory quotient (RQ) in TCFs-treated samples (1, 2) and that of controls (3, 4).

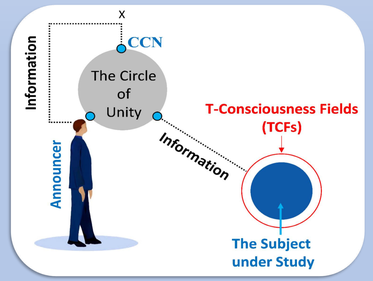
Results

- **OTR comparison**: although the TCFs-treated samples and controls exhibited similar behavior in the lag and death phases, there were different trends in the log phase.
- **CTR comparison**: CTR of both treated samples were significantly lower than control 2, suggesting reduced bacterial metabolic activity under TCFs.
- **RQ comparison**: At the beginning of the period, the value of this index for control was around 1.3; after that the generally declining trend continued to get to just under 1, while treated samples had the opposite behavior and after a long steadiness at 1 value, a gradual increase can be observed in the middle of the growth timescale when it reaches just under 1.2.

The comparison between the OTR averages revealed that the growth rate of treated samples was about 44% lower than controls. Moreover, the doubling time of samples under the influence of TCFs increased by about 75% compared to the controls.

Group-OTR	t1-OTR	t2-OTR	△t (t2-t1)/h	△(ln (t2)-ln (t1))	μ (1/h)	Avg μ in group	D_t (h)	Avg D_t in group	μ Diff with control (%)	D_t Diff with control (%)
Control-1	0.00058	0.01225	3	3.05025	1.017	0.852	0.68	0.84	-	-
Control-2	0.00099	0.01098	3.5	2.40612	0.687		1.01			
TCF-1	0.00135	0.01068	4.5	2.06827	0.459	0.473	1.51	1.47	-44.48	75.00
TCF-2	0.00136	0.01211	4.5	2.18655	0.486		1.43			

TCFs Application



A schematic on applying T-Consciousness Fields (TCFs). The effect of TCFs begins with connecting to the Cosmic Consciousness Network (CCN) and through the Faradarmangar (announcer) [1].

Shannon Entropy

- To investigate the relationship between entropy and the data related to the OTR of the bacterial strain of this research, the obtained OTR values were grouped into categories with the same minimum range.
- This grouping allowed for comparison between samples within each range, preventing a single-member distribution and enabling the inclusion of values relevant to rate calculations.
- Subsequently, the probability associated with each data range (bin of data) is obtained by using the frequency of numbers in each interval and the total number of values of the growth phases for each sample.
- Afterwards, the entropy value is calculated using Shannon's entropy relation for each interval on the growth chart [5]:

$$S = -\sum_i P_i \ln(P_i)$$

Where pi represents the probability of different values of OTR (data range in this study).

Entropy Calculation

Sample in OTR measurements	Log phase		Stationary phase		Death phase		Average of entropy		Difference of Ave. relative to control (%)	
	No. of measurements	Entropy	No. of measurements	Entropy	No. of measurements	Entropy	Log	Death	Log	Death
Control (1)	7	1.946	6	0.637	31	1.646	1.839	1.630	-16.2%	-2.7%
Control (2)	8	1.733	7	1.550	30	1.615				
TCF (1)	10	1.471	5	1.332	30	1.565	1.540	1.586		
TCF (2)	10	1.609	4	1.040	31	1.608				

- Under TCFs treatment, the entropy was on average, 16.2% lower for the log phase and 2.7% lower for the death phase.

Discussion and Conclusion

According to Taheri, applying TCFs leads to achieving the optimal state of the system while obtaining information from the place of total consciousness. Accordingly, previously it has been reported that pure water under influence of TCFs had lower entropy compared to the control [6].

As the curves of OTR and CTR show, these values in the log phase were lower in treated samples offering a reduced metabolic activity. Furthermore, the controls entered the stationary phase sooner than treated samples, so it seems that TCFs treatment slows bacterial growth. Moreover, a gradual increase in RQ of treated samples suggests better survival during the growth cycle of bacteria.

On the other hand, the results of this study showed that the entropy of the stationary phase, as can be expected, was lower than other bacterial life stages. In controls, the higher entropy of the log phase was in accordance with the calculation of growth rate. In other words, there is a definite link between the entropy and the metabolic activity of the cells; hence, the slower growth rate of treated samples was associated with lower entropy.

In conclusion, online monitoring of respiration activity in the present study revealed that samples under TCFs treatment had lower respiratory quotient, longer doubling time and lower growth rate. In addition, these fields reduced the entropy of the log and death phases of *E.coli* growth.

References

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