

Metabolic passage – its costs and benefits

GITA
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Iboga - *Tabernanthe iboga*





Traditional use:

Tonic and stimulant

Reconvalescence after diseases

Ritual substance – initiation into adulthood

Religious use



Addiction interrupter:

Reduction of symptoms and signs of abstinence syndrome

Acceleration of detoxification

Tolerance reversion

Elimination of cravings



Influence on diverse receptors, transporters and enzymes

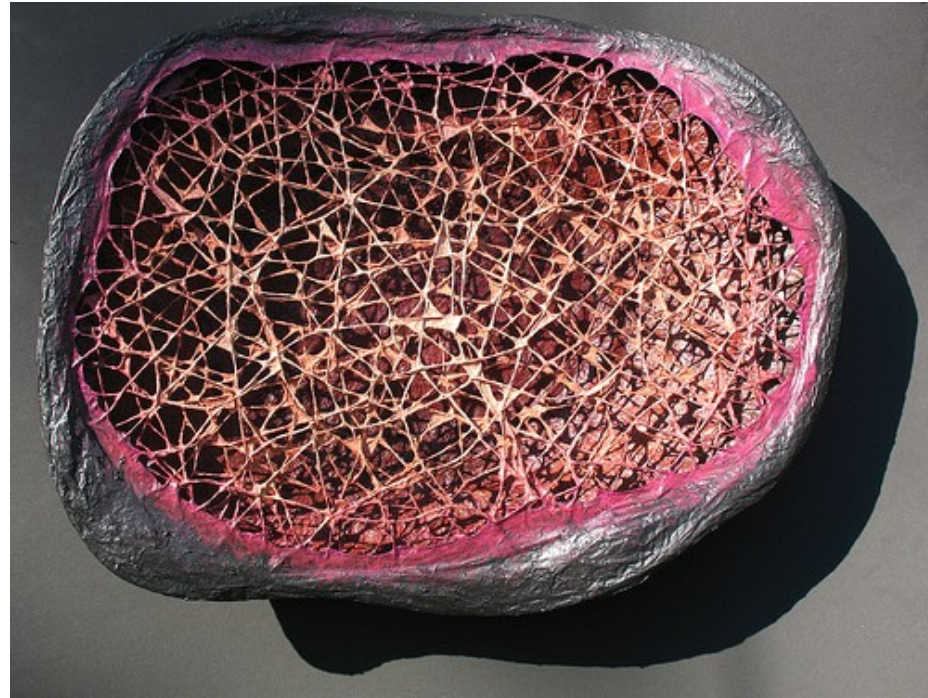
Effects last longer than the presence of ibogaine in the body

Long half-life of metabolite

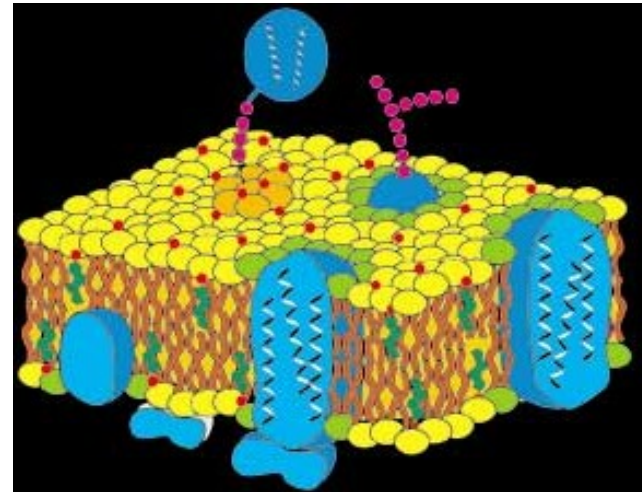
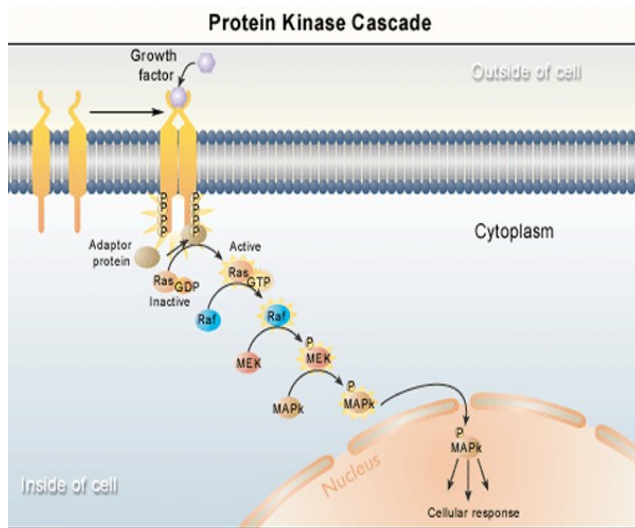
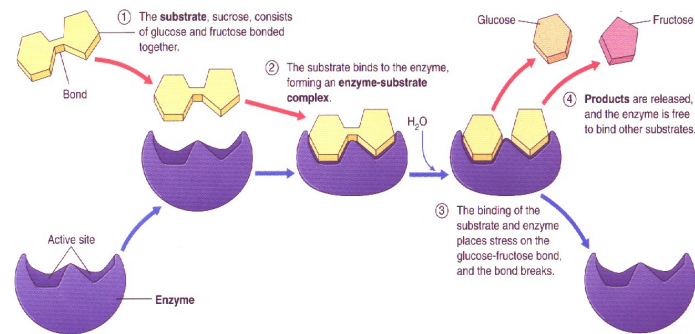
Neurotrophin (GDNF) synthesis and release

Functional and structural remodeling - gene expression and proteome changes

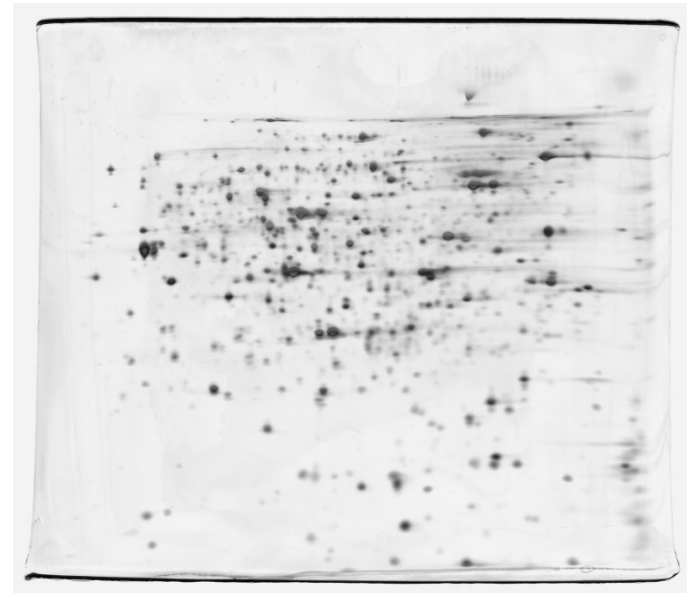
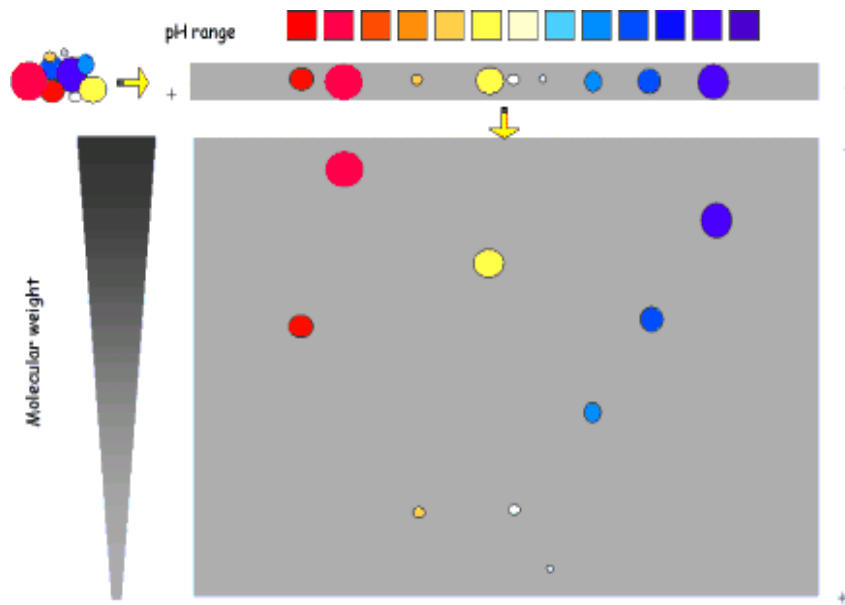
Structural proteins- cytoskeleton

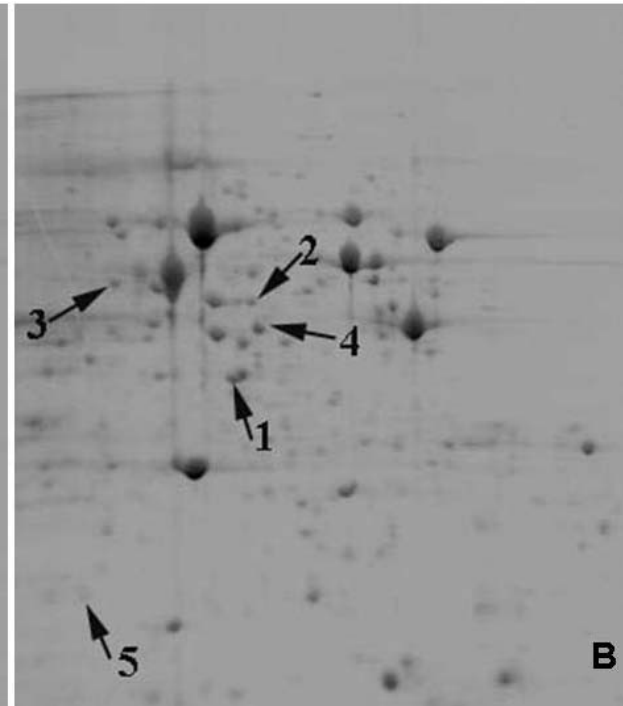


Functional proteins- enzymes, receptors, transporters

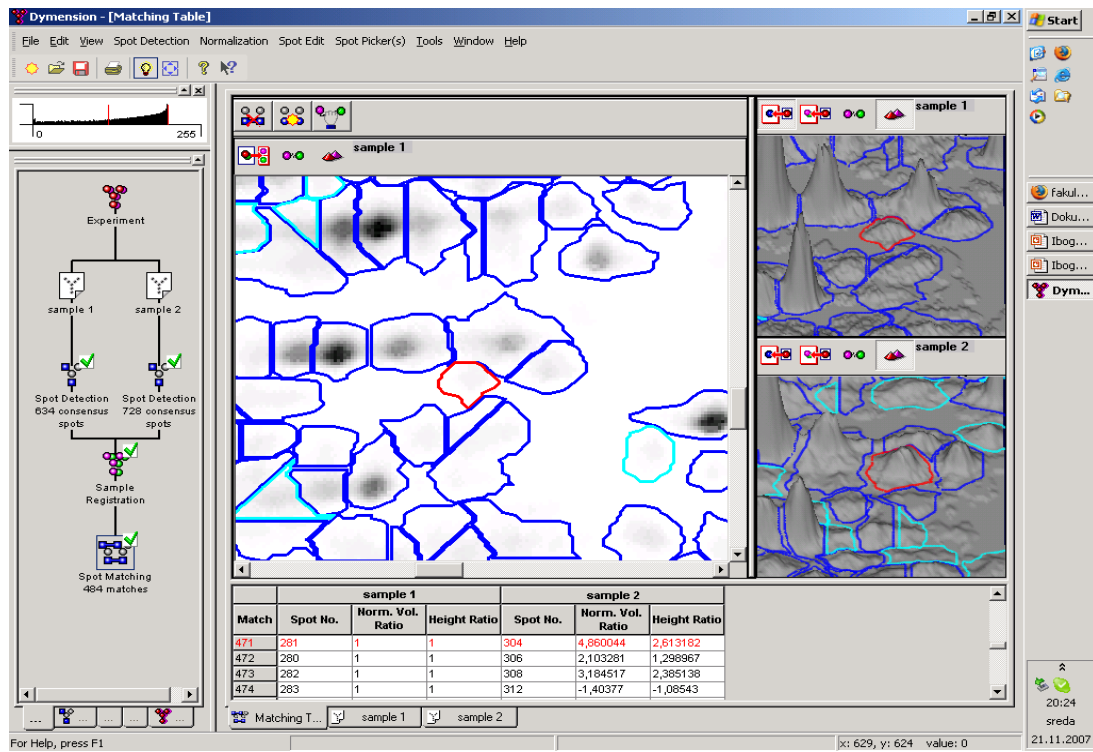


2-D electrophoresis

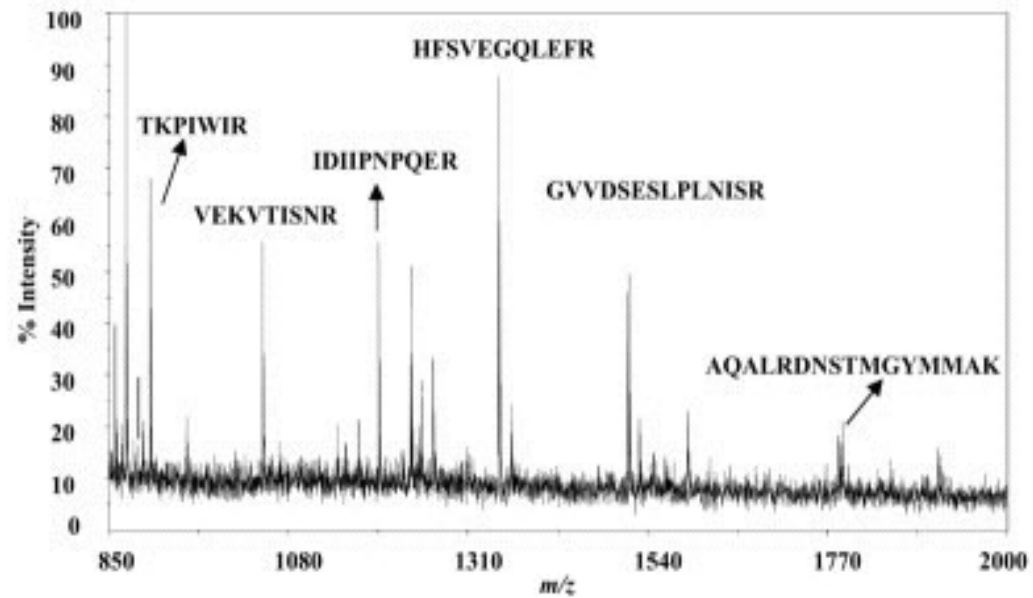




Quantification of changes



Peptide mapping by mass spectrometry

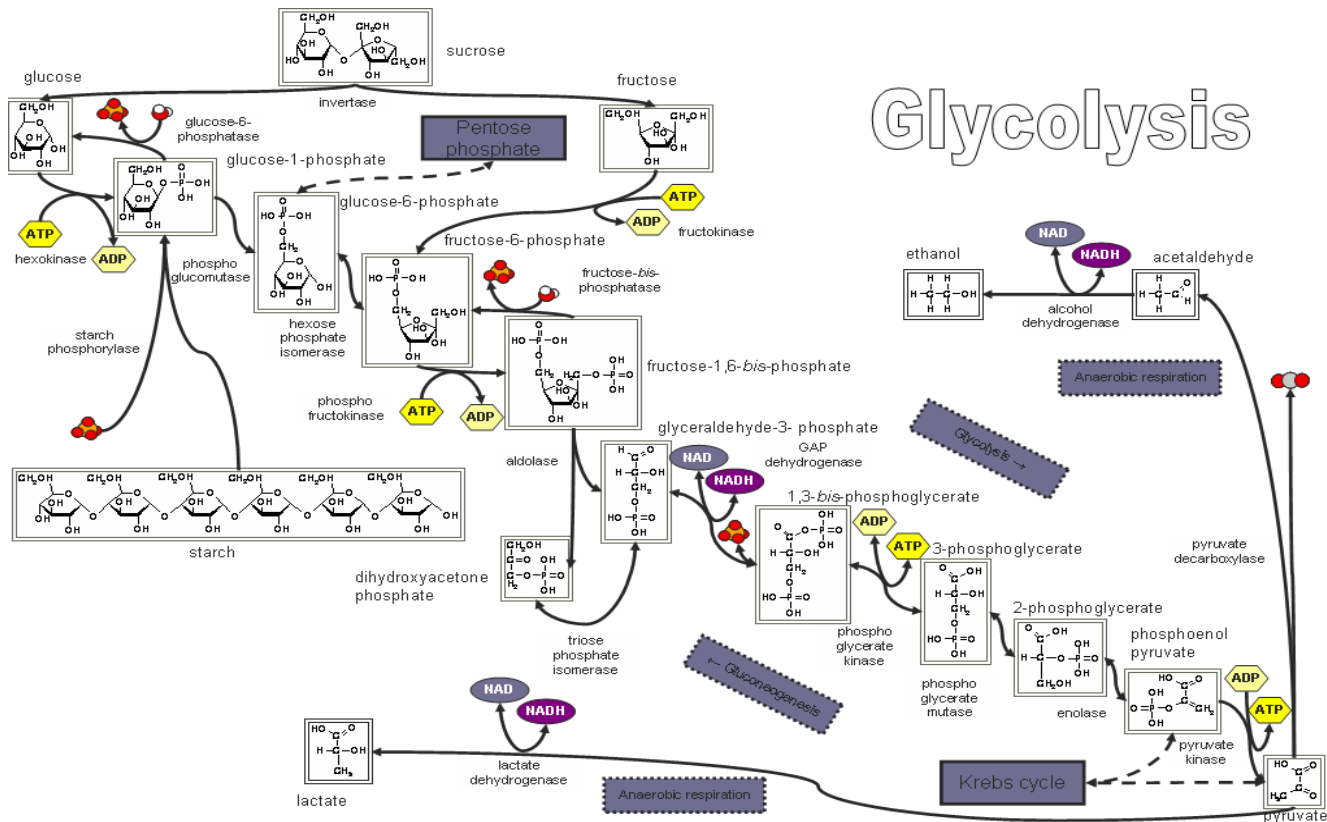


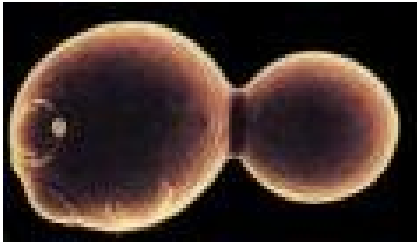


Ibogaine 20 mg/kg i.p. 24 and 72h

Enzyme	Accession number	Fold over control 24 h	Fold over control 72 h	Theoretical M_r (Da)/ pI	Score	Matched peptides
Glyceraldehyde-3-phosphate dehydrogenase	Q9QWU4	1.13	3.21	36090/8.14	62	9
Malate dehydrogenase	42476181	1.42	3.64	36117/8.79	54	9
Aldolase A	6978487	1.23	2.45	39783/8.05	60	9
Pyruvate kinase	206205	1.38	2.94	58314/7.19	70	10

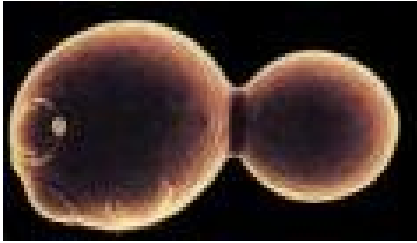
Metabolism of glucose – ATP production



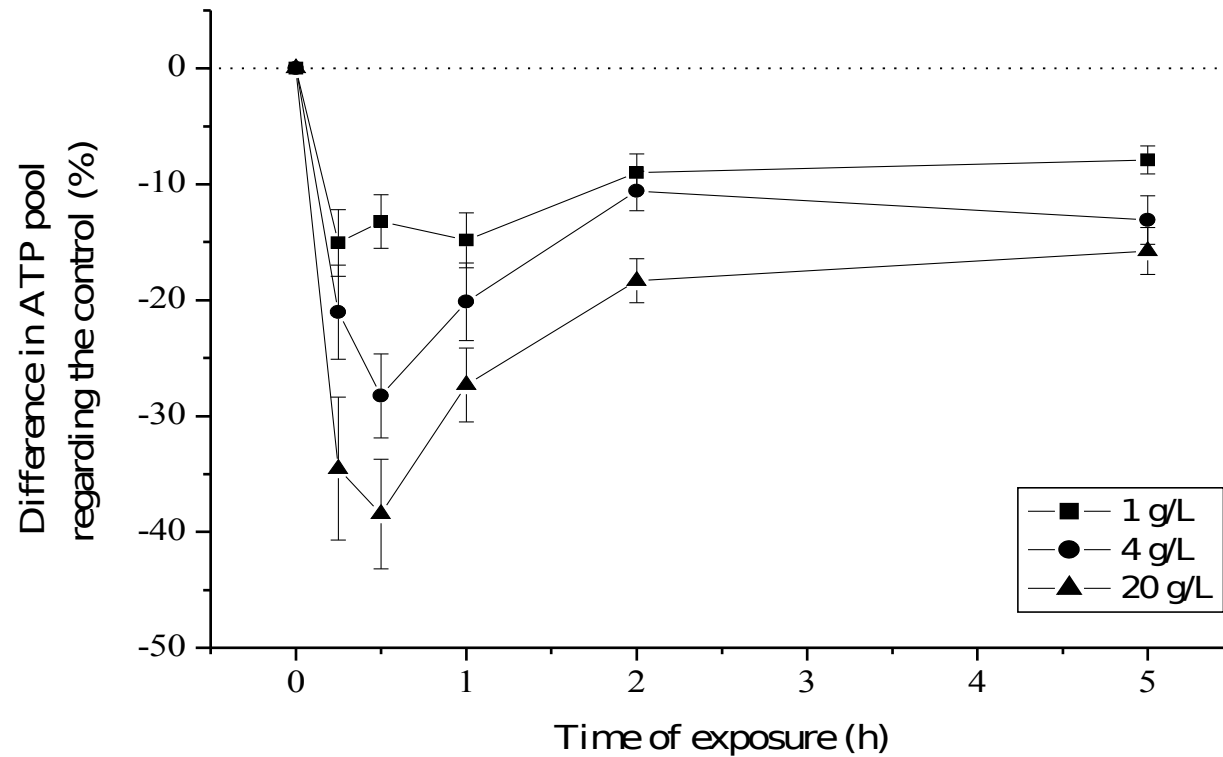


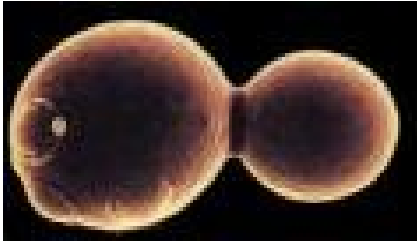
Ibogaine 1 mg/l in media 5h

Spot Enzyme	Swiss-Prot Accession number	Fold Ibogaine/ Control	Theor. M _r (Da)/pI	Matched peptides	Mascot score
Glyceraldehyde-3-phosphate dehydrogenase 3	P00359	6.3	35747/6.46	16	381
Phosphoglycerate kinase	P00540	4.6	44738/7.11	19	492
Enolase 2 (2-phosphopyruvate dehydratase 2)	P00925	3.8	46914/5.67	22	933
Alcohol dehydrogenase 1	P00330	3.2	36823/6.26	29	694
Superoxide dismutase (Cu-Zn)	P00445	2.2	15855/5.62	7	125

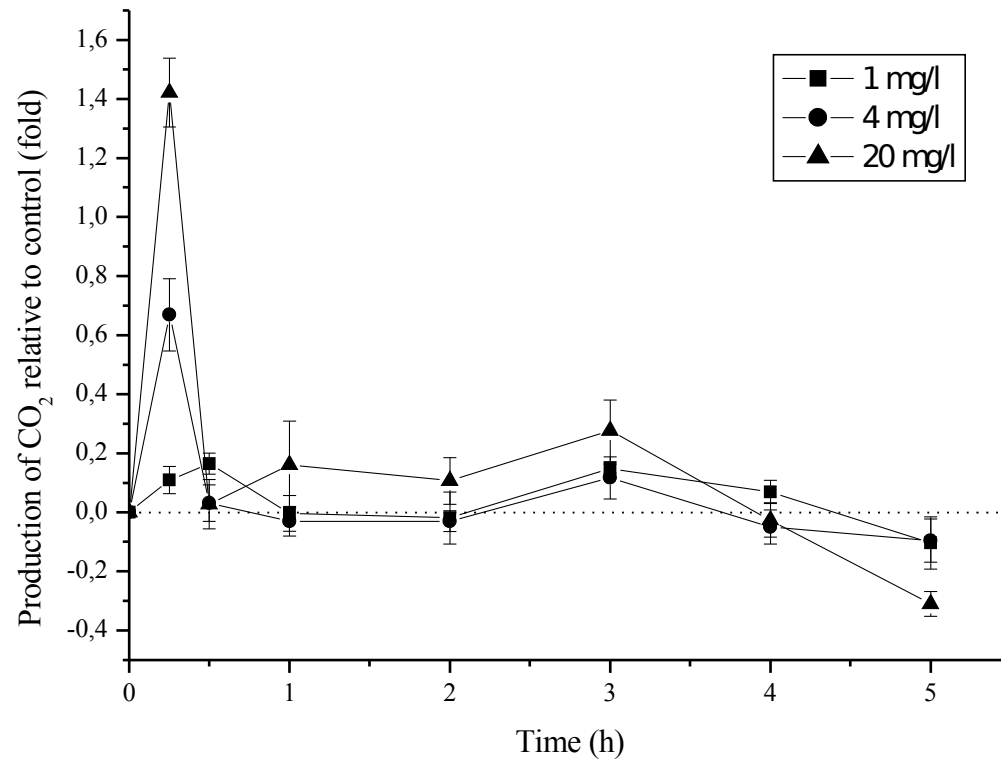


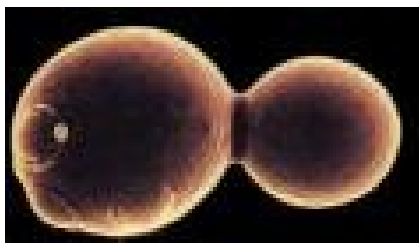
ATP pool under ibogaine





Carbon dioxide production





Dymension - [Matching Table]

File Edit View Spot Detection Normalization Spot Edit Spot Picker(s) Tools Window Help

0 4095

Experiment

```

    graph TD
      Experiment --> Sample1[sample 1]
      Experiment --> Sample2[sample 2]
      Sample1 --> SD1[Spot Detection  
613 consensus spots]
      Sample2 --> SD2[Spot Detection  
711 consensus spots]
      SD1 --> SR[Sample Registration]
      SD2 --> SR
      SR --> SM[Spot Matching  
481 matches]
  
```

sample 1

sample 2

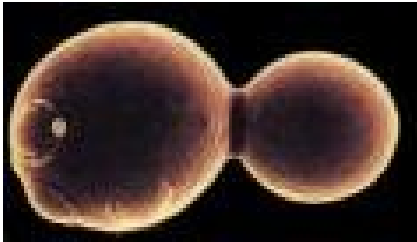
Match	sample 1			sample 2		
	Spot No.	Norm. Vol. Ratio	Height Ratio	Spot No.	Norm. Vol. Ratio	Height Ratio
1	1	1	1	2	1,716901	-1,66894
2	3	1	1			

P... S... P... E...

Matching T... sample 1 sample 2

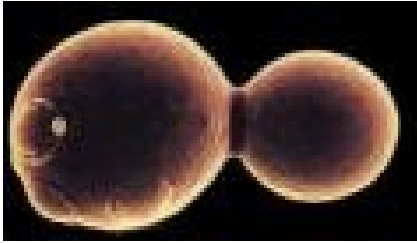
For Help, press F1

Start Dymension - [Match... 8:25

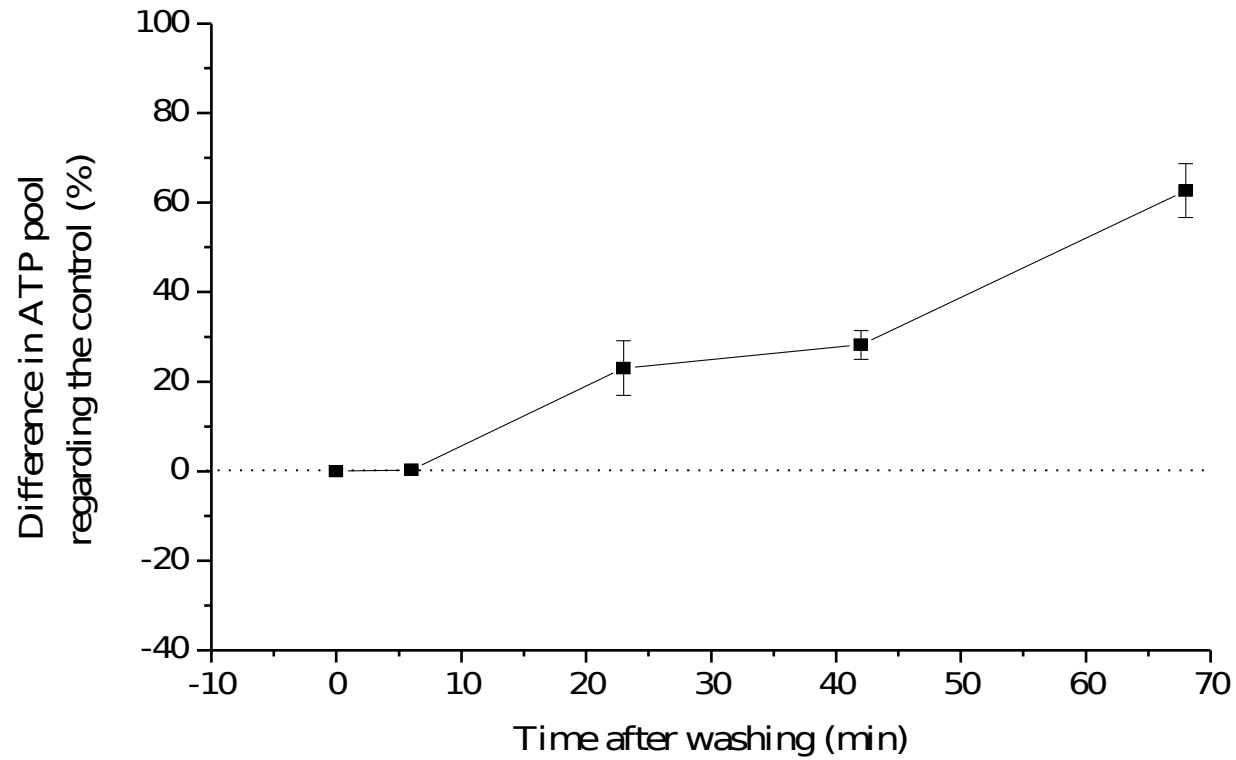


Protein synthesis

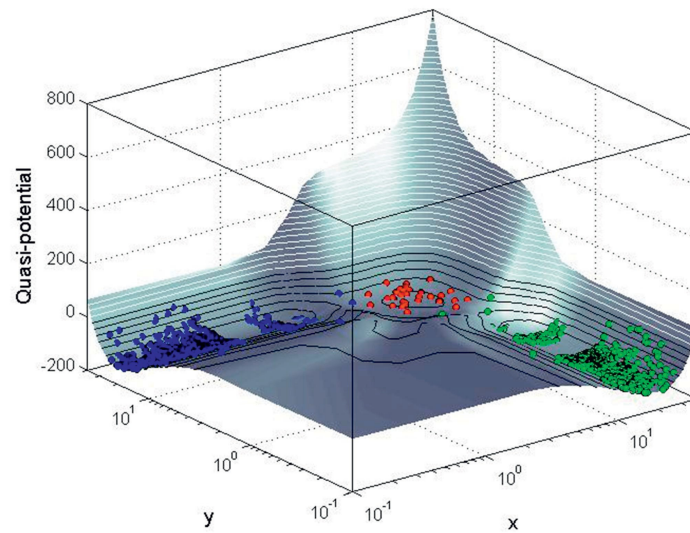
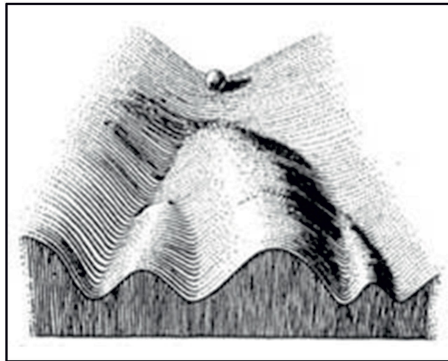
	Treated Σ Normalized Volumes (%)	Control Σ Normalized Volumes (%)	Ratio (Treated/Control)	Ratio (Corrected)
High Abundance Proteins (Normalized Volume ≥ 0.5 %)	36.398	50.103	0.726	1
Low Abundance Proteins (Normalized Volume < 0.5 %)	63.602	49.897	1.275	1.756



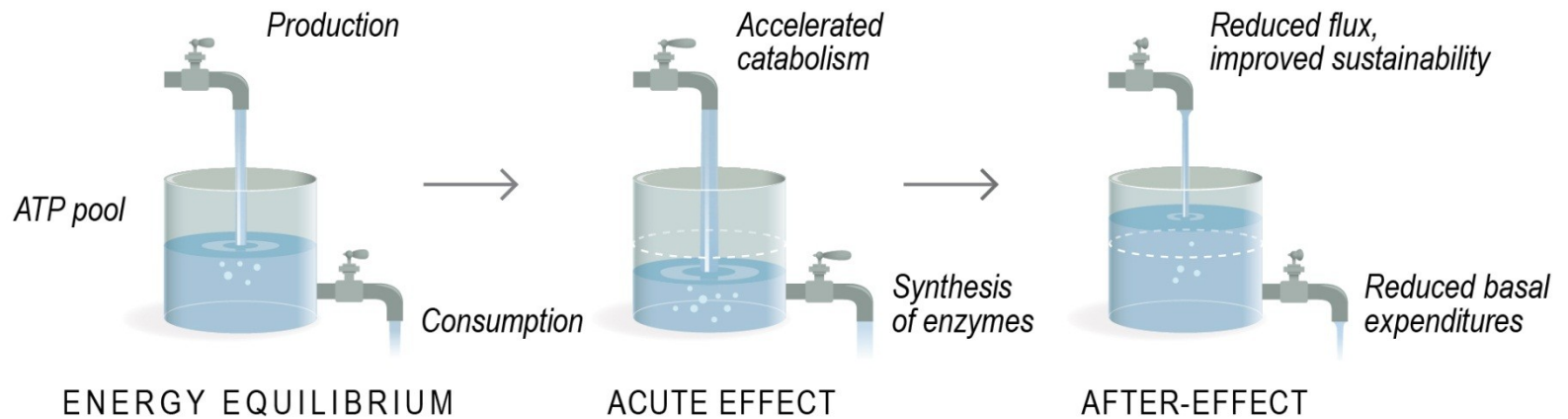
ATP pool after ibogaine



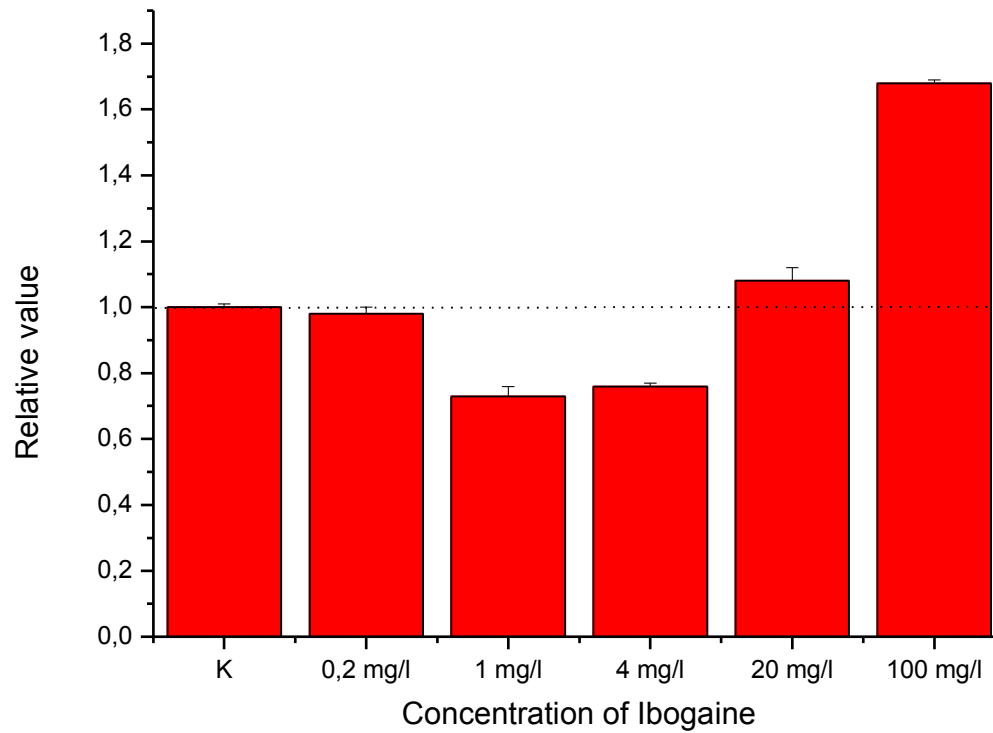
Stabile metabolic shift in the epigenetic landscape



Ibogaine pharmacodynamics

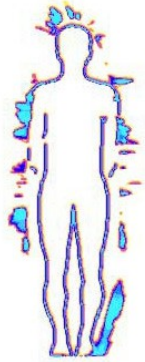


Influence on the total oxidative load



Influence on the total oxidative load

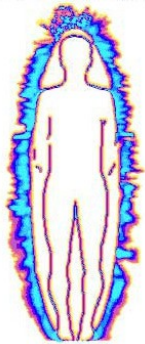
Calculated ibogaine concentration [mg/l]	Ibogaine concentration in cytosol [mg/l]	Oxidative load ratio treated/control [%]	Ascorbic acid concentration [μ M]	Oxidative load reduction by ascorbic acid
1	$0,83 \pm 0,03$	$76,26 \pm 1,69$	1	non-significant
4	$3,89 \pm 0,06$	$76,67 \pm 1,56$	2	non-significant
20	$18,14 \pm 0,34$	$43,45 \pm 1,30$	4	non-significant



Why do you need narcotics Mr. Lee?

I need junk to get out of the bed in the morning, to shave and eat breakfast. I need it to stay alive.

William S. Burroughs, Junkie

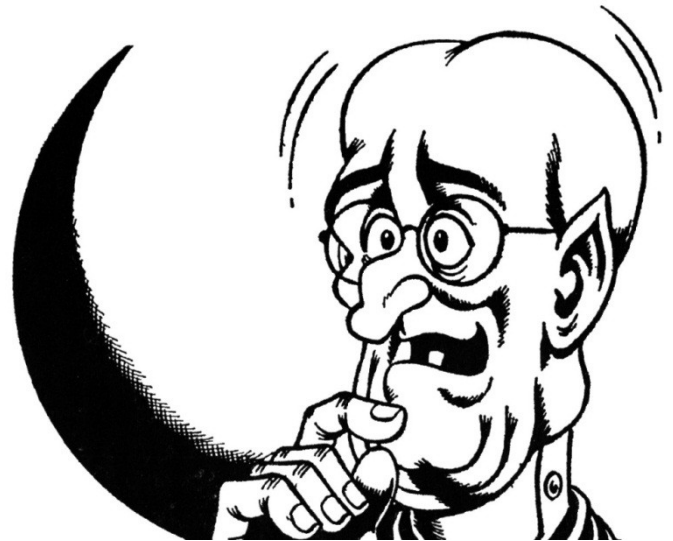


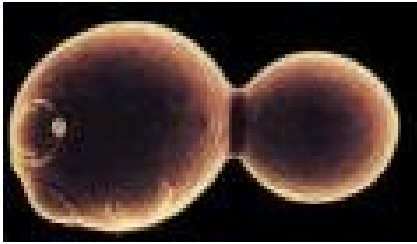
It is not that a warrior learns shamanism as time goes by; rather, what he learns as time goes by is to save energy. This energy will enable him to handle some of the energy fields which are ordinarily inaccessible to him. Shamanism is a state of awareness; the ability to use energy fields that are not employed in perceiving the everyday-life world that we know.

Carlos Castaneda

Increased energy availability

- accelerates metabolic turnover, facilitates metabolic adaptations - detoxification and reversal of tolerance
- enhances mental agility, elevates mood and life will
- facilitates introspection and insight into one's own pathology, helps to locate and solve the problem
- eliminates cravings and protects against recidive





Study showed that ibogaine's influence on metabolism is neither species nor tissue specific

Effect is not mediated by binding of ibogaine to receptors previously described in the literature

Ibogaine shows remedial effect in different pathological conditions, while in health it helps to resist stress in the adaptogene manner

Pharmacodynamics of Entheogen Drugs – Influence on Gene Expression

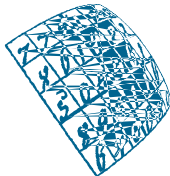


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