Resurse naturale terapeutice din Romania

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Romanian Association of Balneology

Viata intrauterina / impactul balnear
Rolul psiho-emotional al balneoterapiei

Evolutionism

ISTORIA BALNEOLOGIEI

BALNEOTERAPIA

- **Balneoterapia: metoda terapeutica de stimulare - adaptare a organismului, aplicata sub forma bailor, inhalatiilor si ingestiei de factori naturali terapeutici.**

Factori Naturali terapeutici:

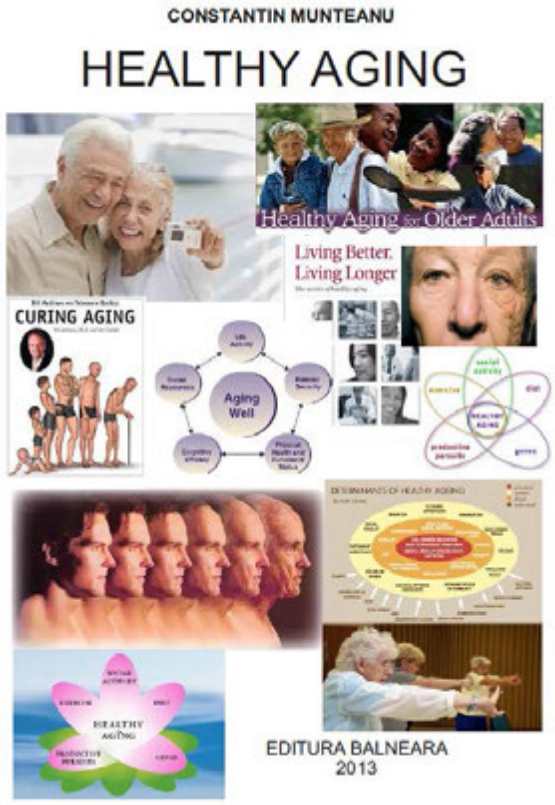
- ✓ **Ape minerale terapeutice carbogazoase, sarate si sulfuroase;**
- ✓ **Lacuri terapeutice: Lacul Ursu – Sovata, Lacul Techirghiol**
- ✓ **Peloizi – namoluri terapeutice;**
- ✓ **Gaze / MOFETE (CO_2, radon and H_2S),**
- ✓ **Factori de bioclimat – CLIMATOTERAPIE**
- ✓ **Microclimat - SPELEOTERAPIE**

Importanţa cercetării resurselor naturale este esenţială în promovarea de către o staţiune balneară a argumentelor care stau la baza proprietăţilor terapeutice ale factorilor naturali, contribuţia lor la sănătate, identificarea mecanismelor biologice prin care aceştia acţionează în organism.

Natural resources for healthy ageing

Healthy Ageing…

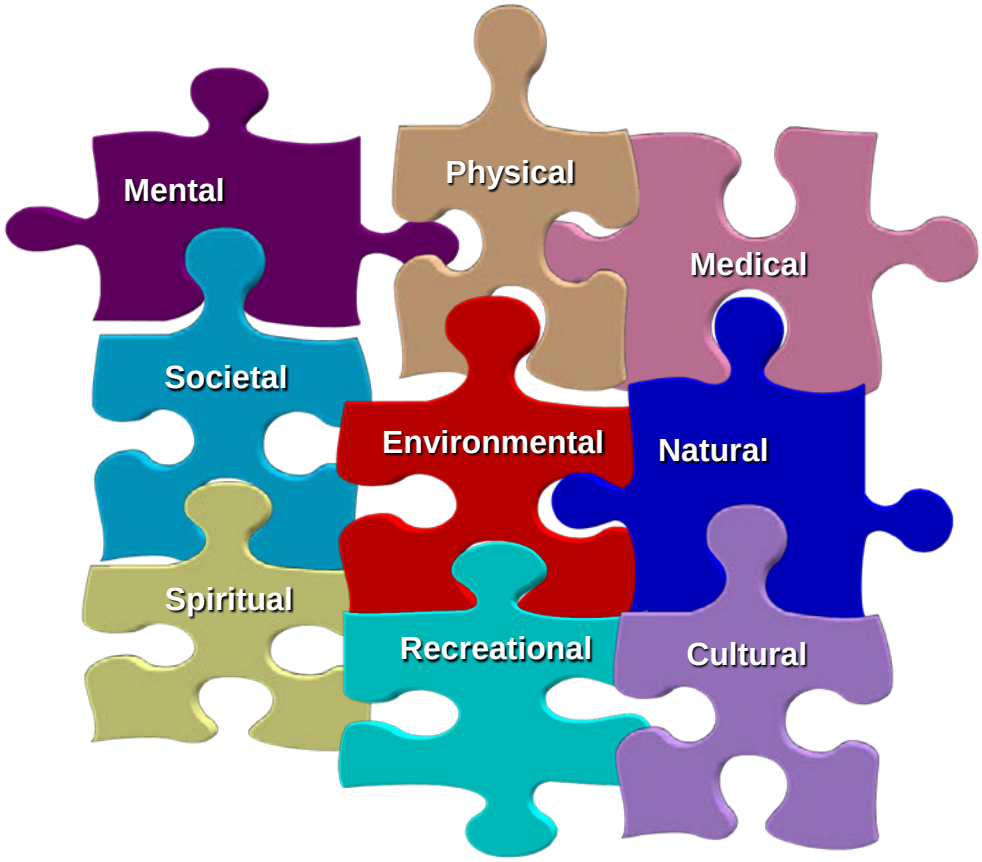
Prof. Dr. Ana Aslan



- Research on healthy ageing interventions has evolved along the main theories of ageing.
- Pharmacological intervention to decelerate ageing and age-related diseases is highly attractive because it would target all the population during many years.
- If successful, healthy ageing therapy will be more efficient in reducing mortality than to fight separately each age-related disease.
- The potential for further advances in this field is immense; hundreds of genes in several pathways have recently emerged as regulators of ageing and caloric restriction.
- Some of these genes, such as IGF1R and FOXO3, have also been associated with human longevity in genetic association studies.

Conceptul de STATIUNE BALNEARA

- **Preventie**
  - Wellness - SPA
  - Educatie pentru sanatate
  - Recreatie / Relaxare
- **Tratament**
  - Curativ
  - Complementar
  - Paleativ
- **Recuperare medicala**



BALNEOLOGIE si Recuperare medicala in bolile cardiovasculare

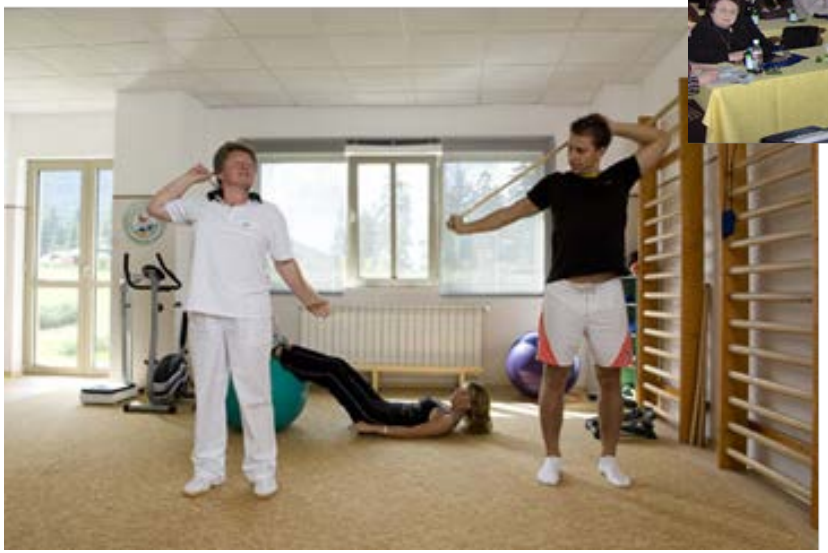
- “Recuperarea cardiaca este reprezentata de programe complexe pe termen lung care includ evaluarea medicala, prescrierea activitatii fizice si modificarea factorilor de risc” (OMS).
- Aceste programe au ca scop limitarea efectelor fiziologice si psihologice ale bolii cardiace, reducerea riscului de moarte subita, controlarea simptomelor cardiace, stabilizarea sau regresia aterosclerozei si ameliorarea statusului psihosocial al pacientilor”

Tratamentul balnear in afectiuni cardiovasculare

Statiuni recomandate:

- Covasna, Baile Tusnad, Vatra Dornei, Buzias
- Calimanesti-Caciulata;
- Baile Herculane, Pucioasa
- Eforie Nord; Techirghiol; Mangalia (doar pentru HTA de granita si HTA usoara, dar trebuie evitate in lunile iulie-august)
- Moneasa; Geoagiu Bai

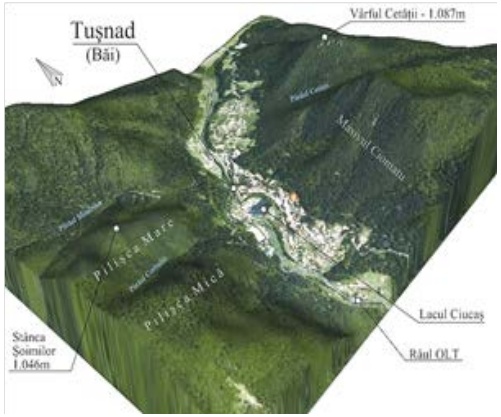
Covasna



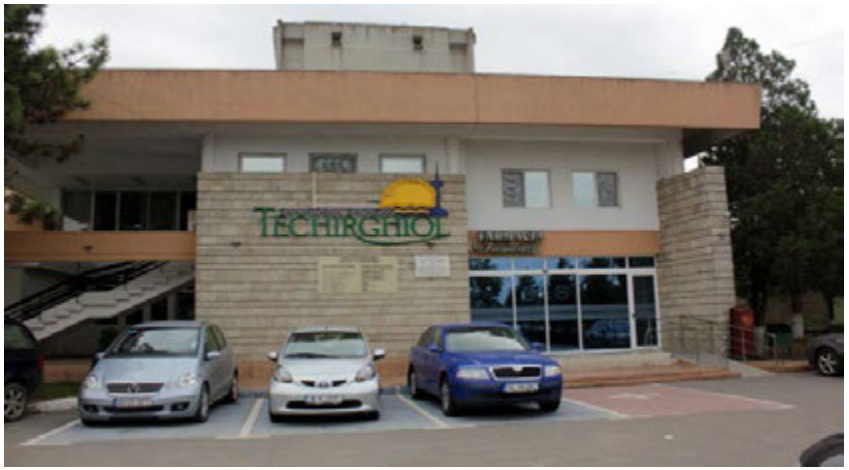
S.C. TURISM COVASNA S.A.

Mofetã

Baile Tusnad



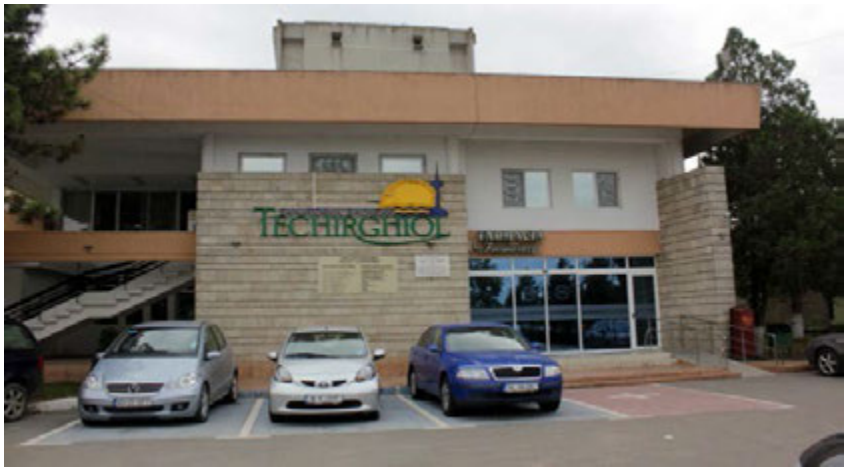
Techirghiol



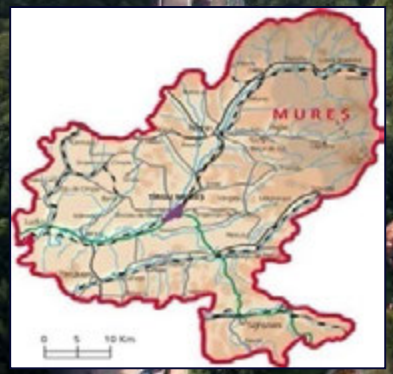
BALNEOLOGIE si Recuperare medicala in afectiuni reumatismale

- Cura în scop profilactic vizeaza sindroame dureroase musculo-articulare persistente
- Cura în scop terapeutic vizeaza poliartrita reumatoidã în stadii incipiente, cu fenomene inflamatorii prezente, spondilitã ankilozantã, artropatie psoriazicã şi artritele secundare unor infecţii
- Cura de recuperare se adreseazã bolnavilor cu poliartritã reumatoidã în stadiile II sau III stabilizate biologic, dar cu deficite funcţionale, forme de poliartritã reumatoidã ce au suferit intervenţii ortopedico-chirurgicale şi forme constituite de spondilitã ankilozantã;
- Obiectivele curei sunt diminuarea durerii, combaterea atrofiilor musculare, creşterea mobilităţii articulare, creşterea capacităţii de apărare a organismului, reechilibrarea terenului neuro-vegetativ.
- Staţiunile balneo-climatice din ţara noastră sunt bine organizate şi numeroase unităţi medicale care pot rezolva această categorie de pacienţi, în special Techirghiol, Sovata, Eforie Nord, Mangalia, Amara, Băile Felix .

Techirghiol



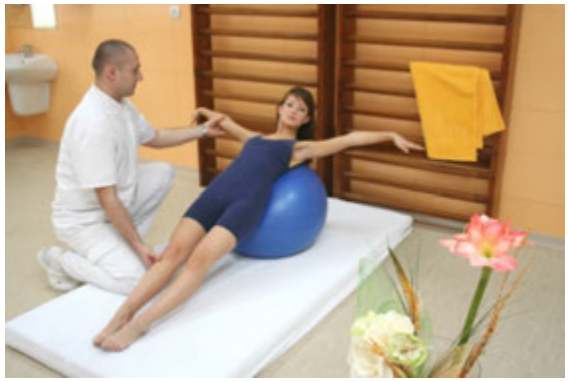
Sovata



Baile Felix


ROMANIA
HARTA RUTIERA
Ucraina
Ungaria
Serbia
Bulgaria
Bulgaria
Oradea
Arad
Timisoara
Cluj-Napoca
Bistrita
Targu Mures
Sibiu
Brasov
Bucharest
Constanta
Suceava
Iasi
Bacau
Braila
Galati
Ploiesti
Craiova

felixspa.com



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Cercetarea factorilor terapeutici naturali

Biomarkeri

In contextul complex al functionarii organismului si al procesului patologic, descris ca un puzzle cu numeroase variabile independente, dificil de analizat, apare ca o necesitate identificarea unor biomarkeri relevanti a caror evolutie ne permite sa aducem dovezi privind valoarea terapeutica a factorilor naturali utilizati in statiunile balneare.

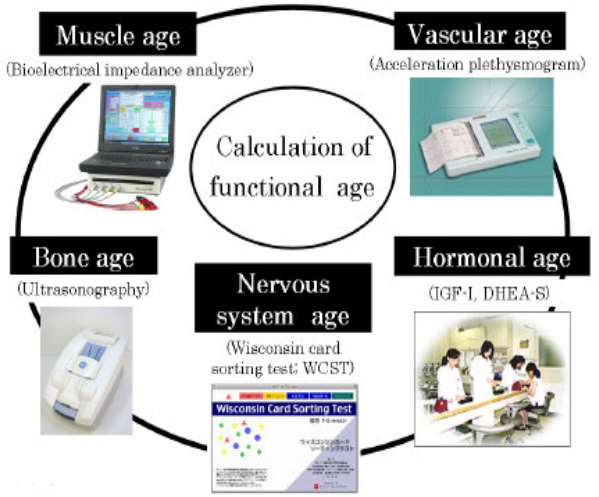


Fig. 1. Anti-Aging Medical Checkup

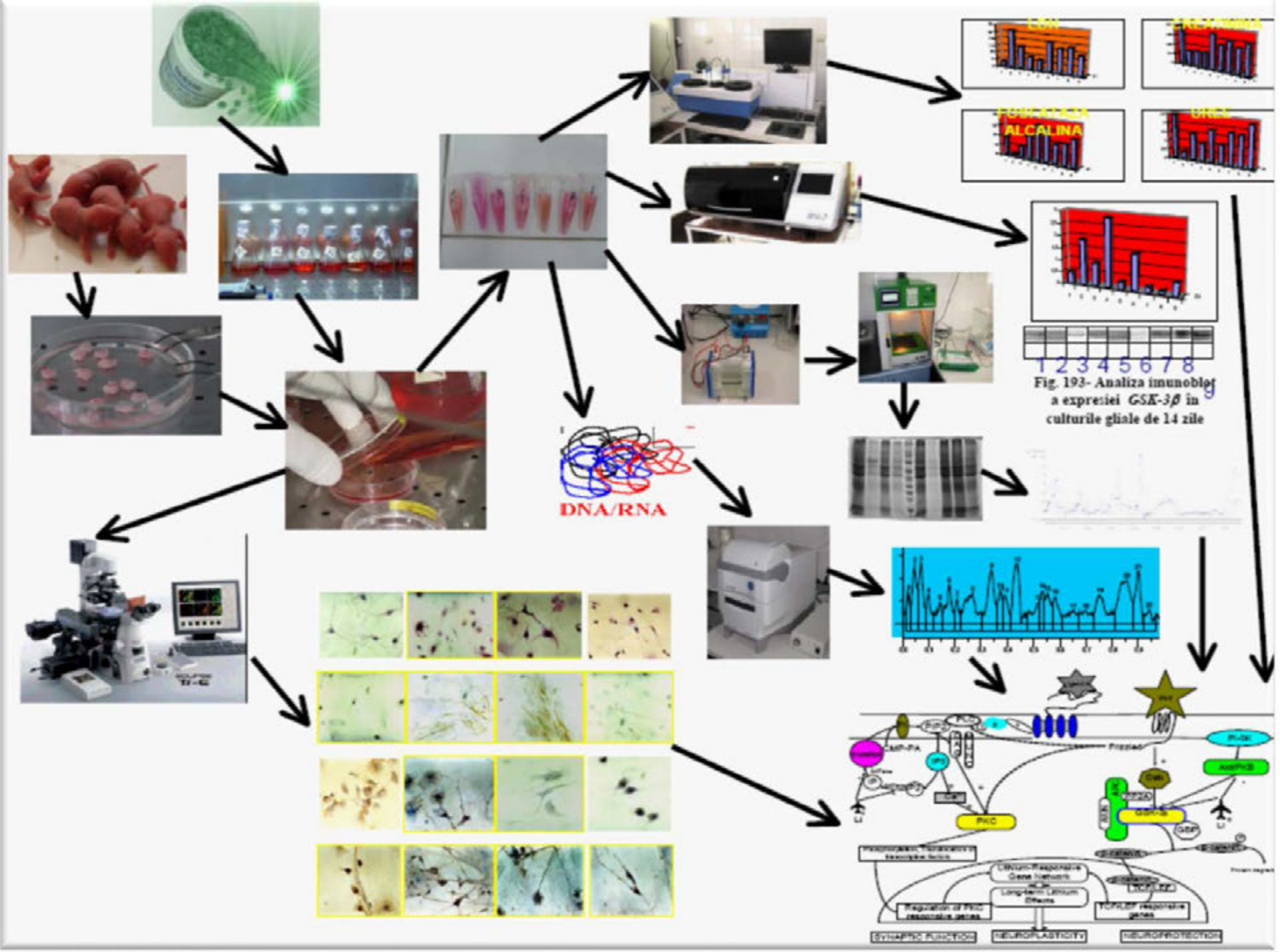
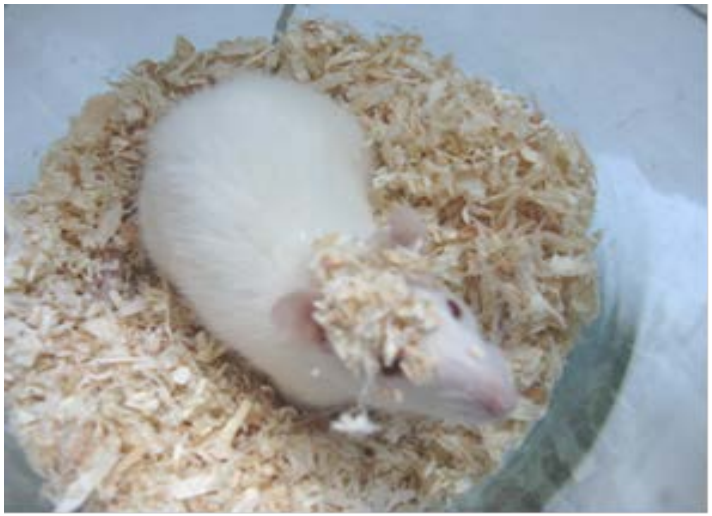
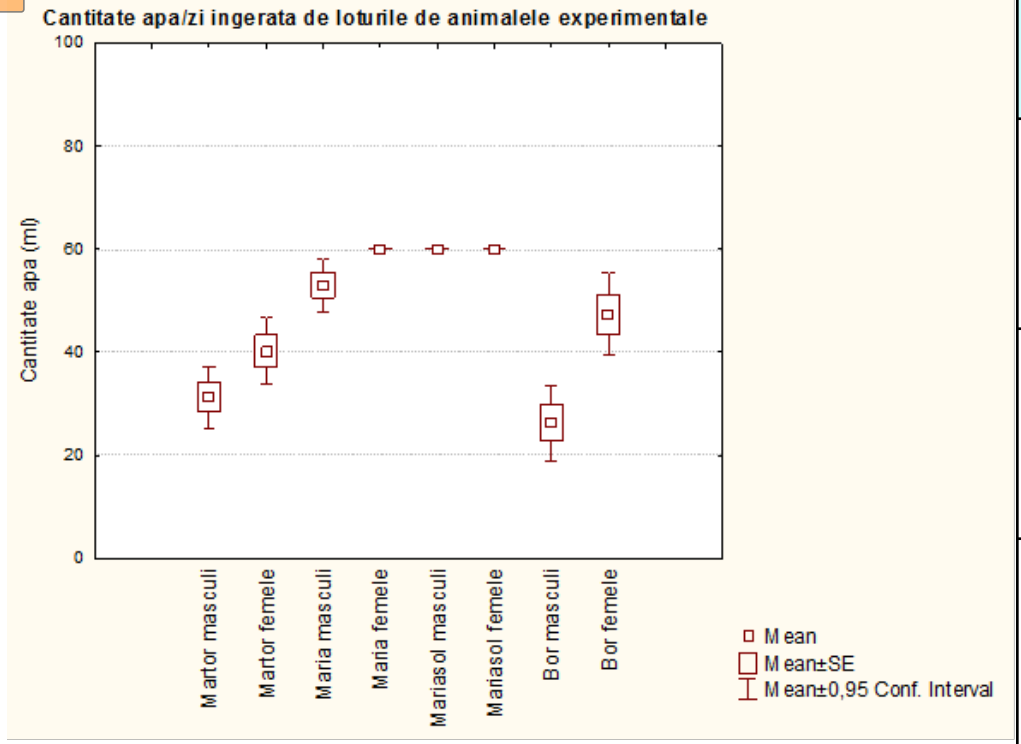


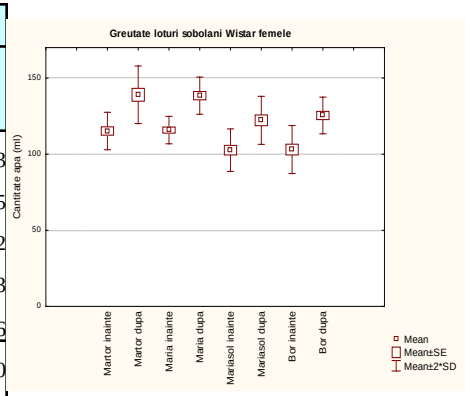
Fig. 193- Analiza imunoblot a expresiei *GSK-3β* in culturile gliale de 14 zile

Animal model study: effects of Mary Mineral Water from Malnas Bai, Romania

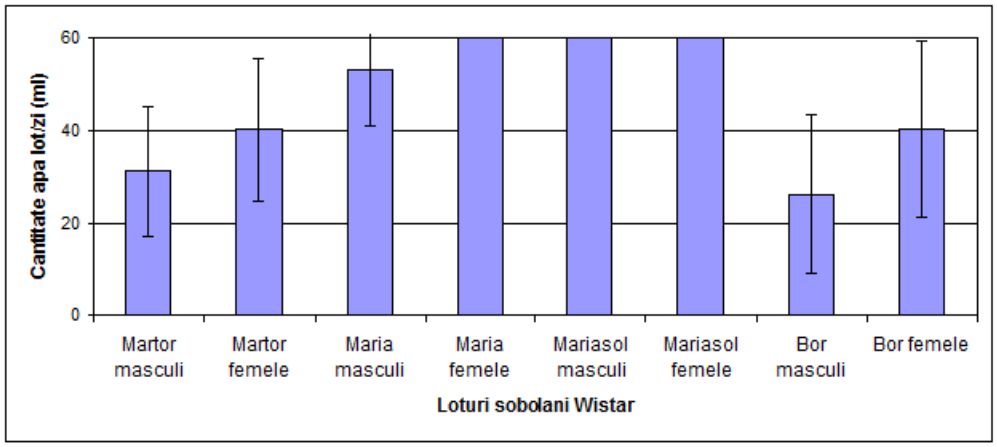


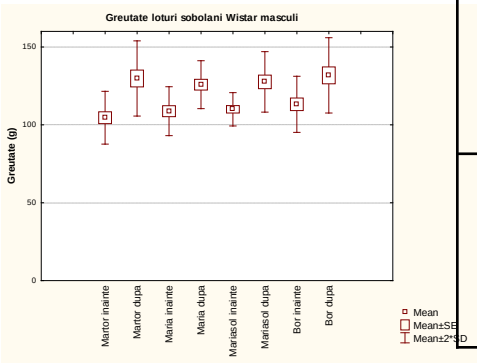


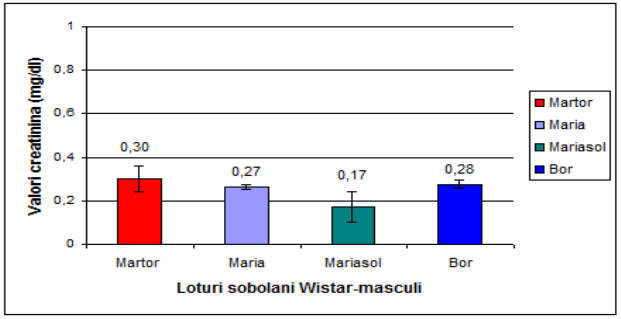
Loturi sobolani masculi	Greutate (g)	
	inainte	dupa
Martor	108	113
	107	125
	106	132
	112	133
	90	146
Maria	111	130
	101	135
	100	128
	116	120
	116	116
Mariasol	113	116
	112	143
	103	126
	116	126
	106	127
Bor	112	116
	118	144
	126	134
	104	123
	106	142

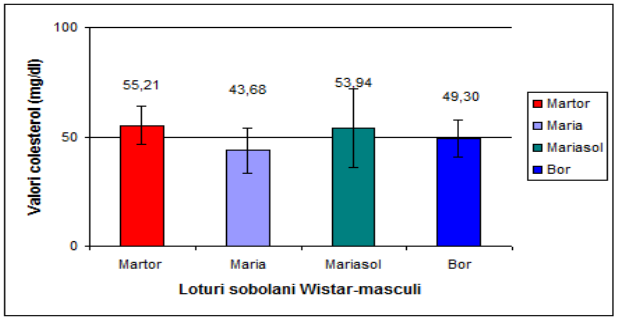


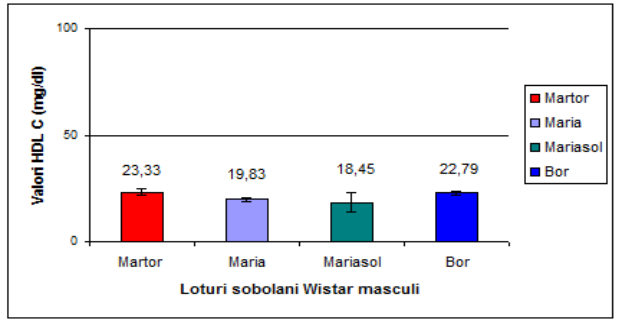
Loturi sobolani femele	Greutate (g)	
	inainte	dupa
Martor	120	128
	108	143
	123	153
	113	135
	112	136
Maria	108	138
	119	143
	118	132
	118	133
	116	146
Mariasol	111	126
	108	124
	94	120
	102	131
	98	110
Bor	98	127
	113	135
	110	120
	96	124
	98	121

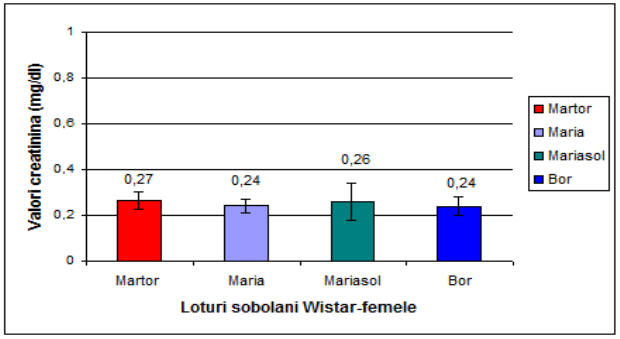


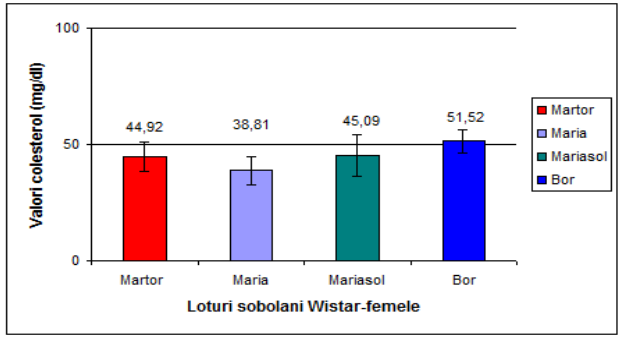


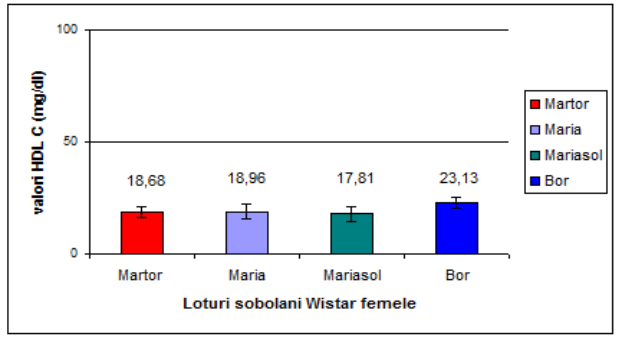

Valori creatinina (mg/dl)
1
0,8
0,6
0,4
0,2
0
0,30
0,27
0,17
0,28
Martor
Maria
Mariasol
Bor
Loturi sobolani Wistar-masculi

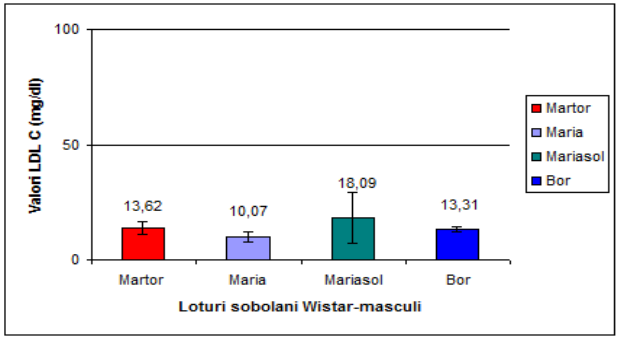

Valori colesterol (mg/dl)
100
50
0
55,21
43,68
53,94
49,30
Martor
Maria
Mariasol
Bor
Loturi sobolani Wistar-masculi

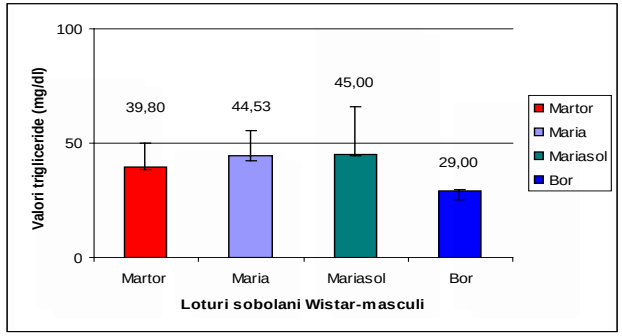

Valori HDL C (mg/dl)
100
50
0
23,33
19,83
18,45
22,79
Martor
Maria
Mariasol
Bor
Loturi sobolani Wistar masculi

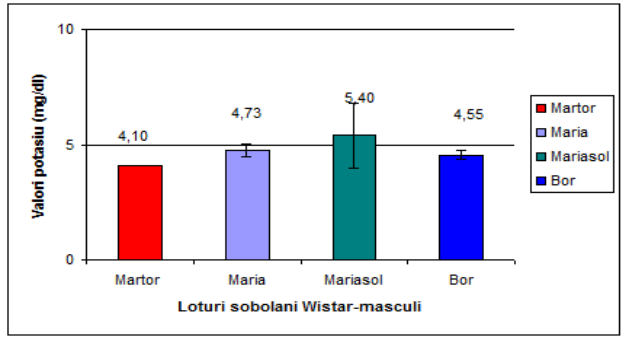

Valori creatinina (mg/dl)
1
0,8
0,6
0,4
0,2
0
0,27
0,24
0,26
0,24
Martor
Maria
Mariasol
Bor
Loturi sobolani Wistar-femele

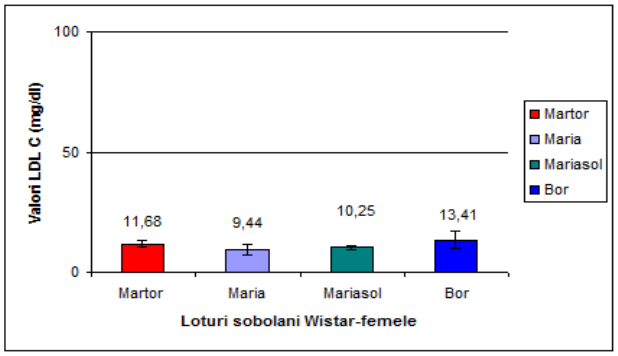

Valori colesterol (mg/dl)
100
50
0
44,92
38,81
45,09
51,52
Martor
Maria
Mariasol
Bor
Loturi sobolani Wistar-femele

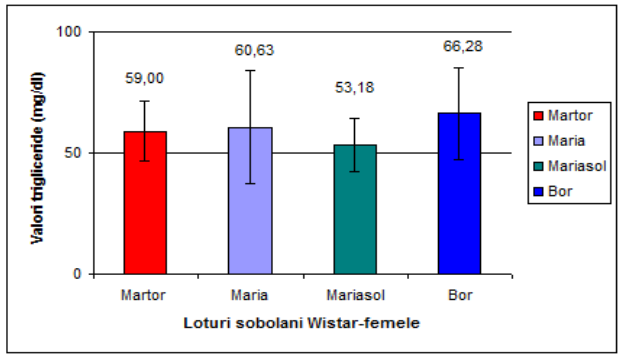

valori HDL C (mg/dl)
100
50
0
18,68
18,96
17,81
23,13
Martor
Maria
Mariasol
Bor
Loturi sobolani Wistar femele

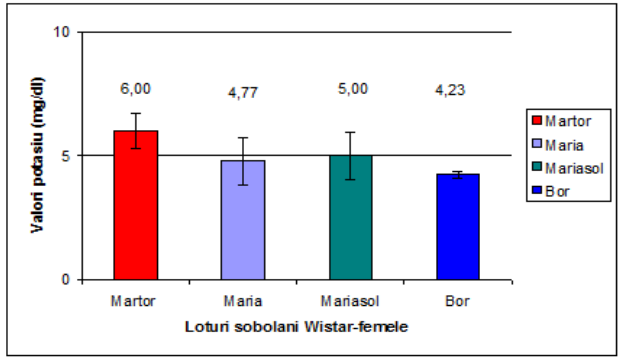

Valori LDL C (mg/dl)
100
50
0
13,62
10,07
18,09
13,31
Martor
Maria
Mariasol
Bor
Loturi sobolani Wistar-masculi


Valori triglyceride (mg/dl)
100
50
0
39,80
44,53
45,00
29,00
Martor
Maria
Mariasol
Bor
Loturi sobolani Wistar-masculi


Valori potasiu (mg/dl)
10
5
0
4,10
4,73
5,40
4,55
Martor
Maria
Mariasol
Bor
Loturi sobolani Wistar-masculi


Valori LDL C (mg/dl)
100
50
0
11,68
9,44
10,25
13,41
Martor
Maria
Mariasol
Bor
Loturi sobolani Wistar-femele


Valori triglyceride (mg/dl)
100
50
0
59,00
60,63
53,18
66,28
Martor
Maria
Mariasol
Bor
Loturi sobolani Wistar-femele


Valori potasiu (mg/dl)
10
5
0
6,00
4,77
5,00
4,23
Martor
Maria
Mariasol
Bor
Loturi sobolani Wistar-femele

CARBOGASEOUS MINERAL WATER FOR PATIENTS WITH METABOLIC SYNDROME

Daniela Poenaru, Delia Cinteza, Constantin Munteanu, Victorita Marcu, Sebastian Diaconescu, Dan Dumitrascu, Horia Lazarescu
National Institute of Rehabilitation, Physical Medicine and Balneology – Bucharest, Romania

HCO3: 1903,2 mg/l,
CO2: 2868,4 mg/l
Ca: 384,4 mg/l
Mg: 107, 1 mg/l,
Total mineralization: 2554 mg/l.

- **Introduction**

The carbogaseous mineral water from Borsec, nr 1 spring, was intensively studied before '90; its effect on decreasing the level of glycemia in diabetics are well known. This results were reinforced in more recent studies. Traditionally, this mineral water is also used for people with metabolic and endocrinologic disorders.

- **Objective**

The present study intends to evaluate the influence of carbogaseous mineral water from Borsec, nr 1 spring, on the components of metabolic syndrome

- **Materials & Methods**

The study is a prospective one, single-blind, controlled.

45 patients with metabolic syndrome were divided in 3 groups; group A received tap water, group B (study group)- carbogaseous mineral water r and group C- plain water, for 3 weeks, 2 liters daily.

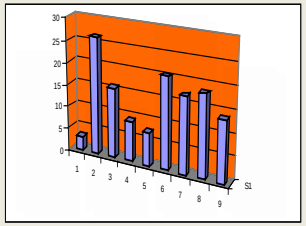
The following biological parameters were determined at the beginning and after 3 weeks: MCP – 1 (monocyte chemoatractant protein-1), Human MCSF (macrophage colony stimulating factor), TNF beta, Interleukine 6, PCR high sensitivity, Glycemia, Cholesterol (total, LDL, HDL), Triglycerides, Uric acid, Fibrinogen.

- **Results**

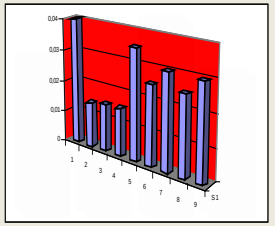
The statistical analysis of the obtained data didn`t find significant differences between the groups, but the results are encouraging.

Some of the data showed favorable improvement for the study group of the level of glycemia, uric acid, cholesterol, both HDL and LDL fractions, even these results are not statistical significant

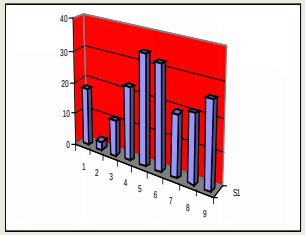
GLUCOZA SERICA



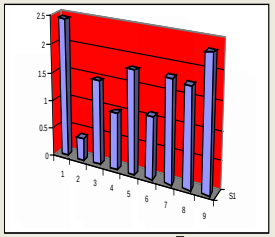
ACID URIC



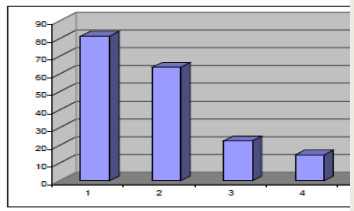
COLESTEROL



TRIGLICERIDE



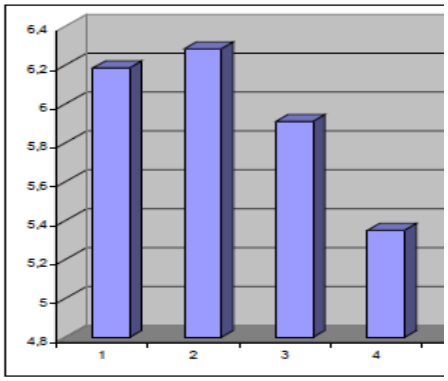
IL6, CRP, MCSF, TNF-β, MCP



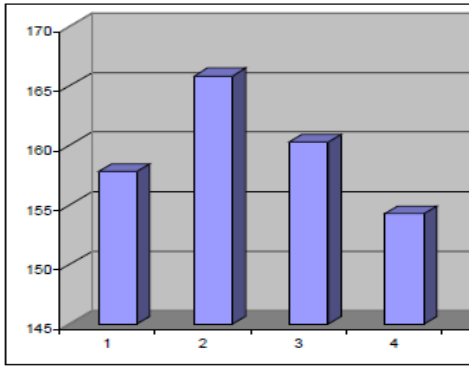
Scientific arguments

Experimental Design

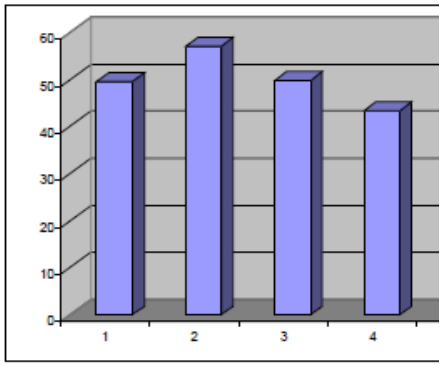
Uric acid



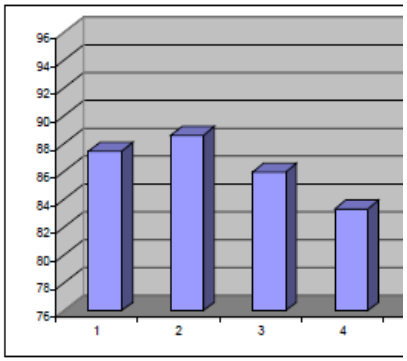
Cholesterol



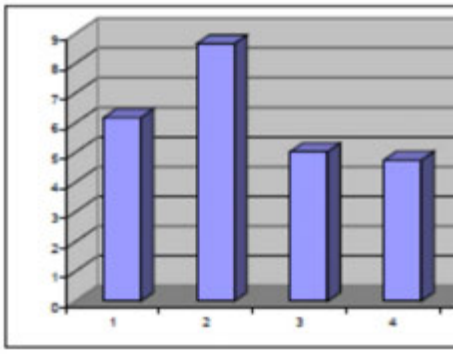
HDL



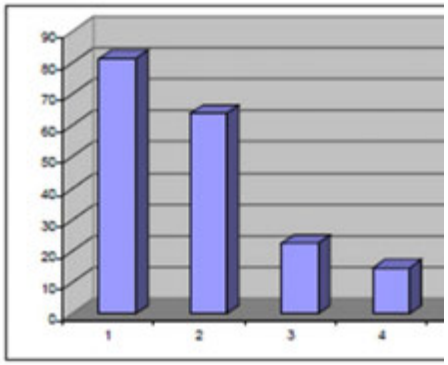
LDL



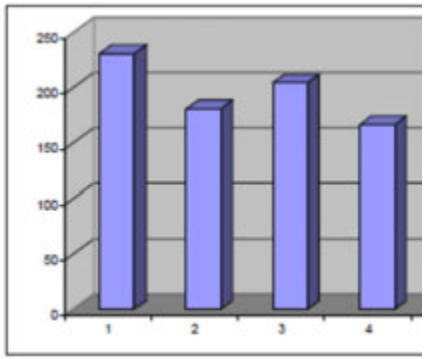
CRP



IL6



MCP-1



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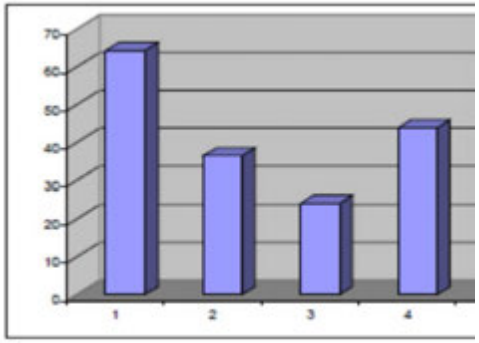
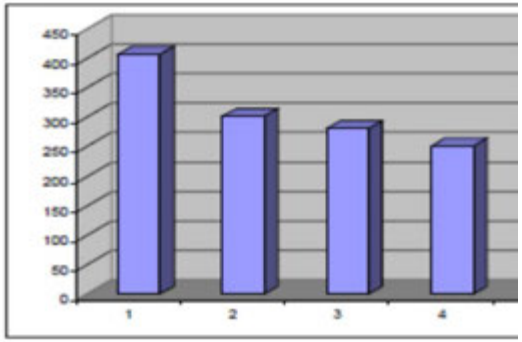


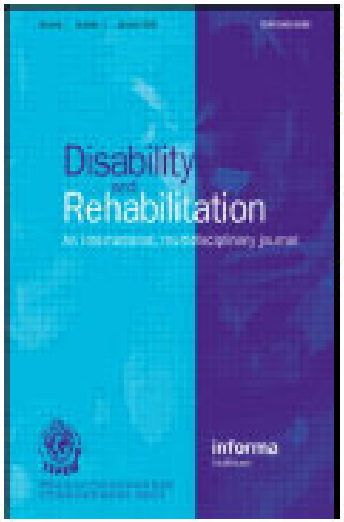
TNF-β



Conclusions: Drinking cure of carbogazeous water of nr. 1 Borsec spring had demonstrate good clinical effects in lowering the serum level of glycemia an uric acid. This study open a gate to show more deep effects on the markers of inflammation. It is possible to have one more weapon in our fight to prevent cardiovascular and cerebrovascular diseases.

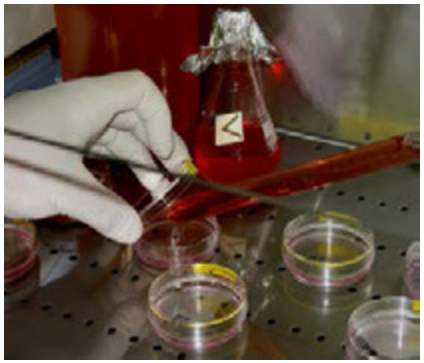
Speleotherapy: a special kind of climatotherapy, its role in respiratory rehabilitation

Tibor Horvath[a]
[a] Municipal Hospital, Tapolca, Hungary



Balneo

Speleotherapy, the use of the climate of caves, is an accepted but not widely known therapeutic measure in the treatment of chronic obstructive airway diseases. This study summarizes the therapeutic experience of more than 4000 patients who were treated in a 10-year period in a hospital-cave complex in Tapolca, Hungary. A sharp and long-lasting clinical improvement and a significant recovery from airway obstruction could be observed in the overwhelming majority of patients. It is established that the microclimate of some caves can beneficially affect these disorders and the cave should be considered as an optimal environment for complex respiratory rehabilitation.



Objective: To explore the effects of speleotherapy on cellular morphology and physiology of pulmonary fibroblasts obtained from tissues of Wistar rats, in normal and Ovalbumin challenged "asthmatic" conditions.

Materials and methods:

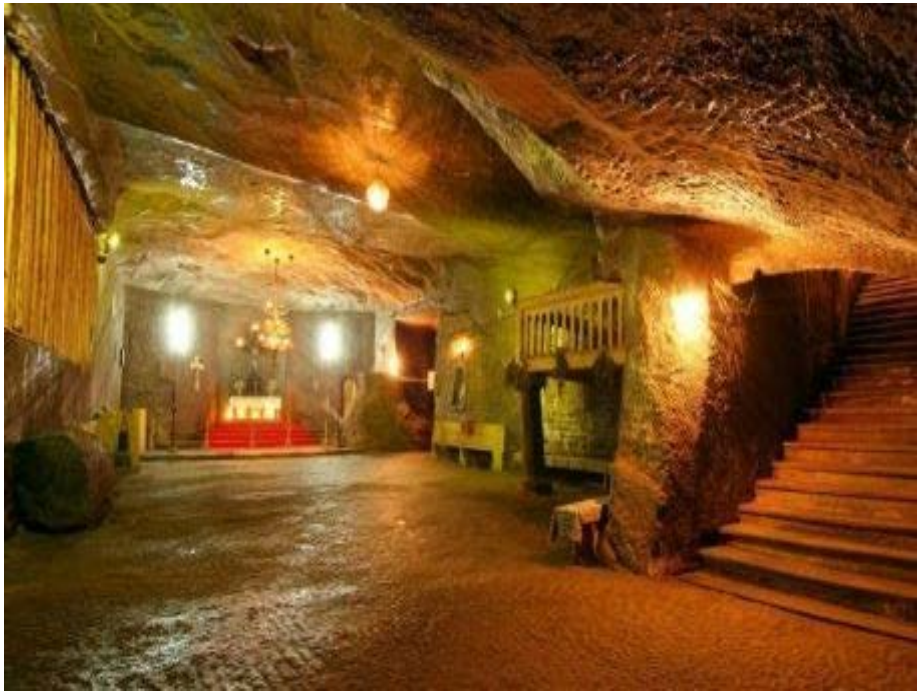
Wistar rats of 75-100 g weight were divided in two lots: control and ovalbumin challenged animals. Ten animals of each lot were send to Turda, Cacica and Dej Salt Mine for 14 days and maintained in the salt mine medium, as in speleotherapy treatment.

Pulmonary fibroblasts cultures were prepared from Wistar rat lung Assessing changes in cellular and molecular level can be achieved by optical microscopy, immuno-histo-chemistry studies, electrophoresis and Western blotting. The proteins electrophoresis from the total homogenate has as the purpose to establish the changes, which are revealed at the proteic level of fibroblasts cultures obtained from rats held on saline mine medium for speleotherapy.

Analysis with GeneTools software v. 4 from SynGene of each track of the electrophoresis allowed us to compare the profiles of the total proteins expression.

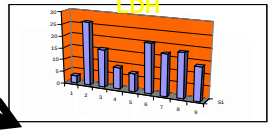
SalinaTurda

Salina Cacica



Salina Dej


DEJ
STIRILE
SOMEŞ TV
POTENTIALUL TURISTIC AL SALINEI DIN DEJ,
VALORIFICAT DIN 2014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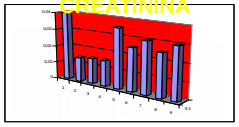
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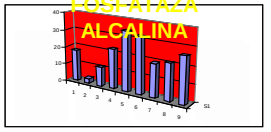
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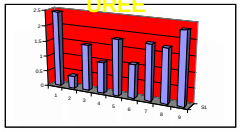
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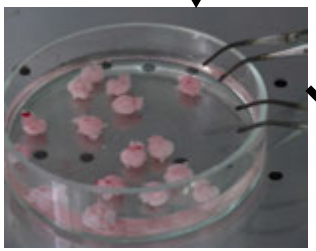
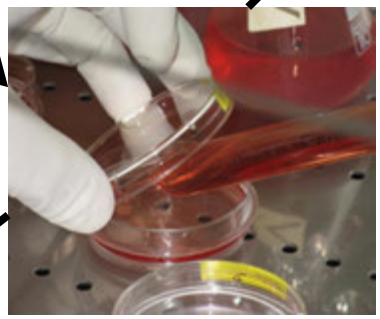
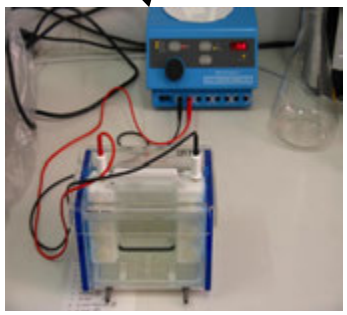
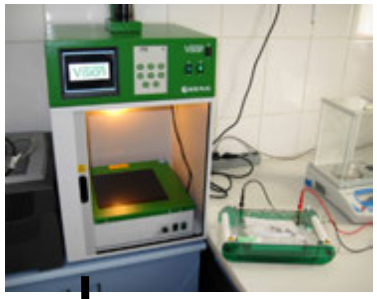
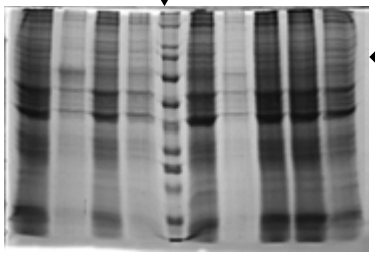
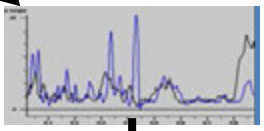


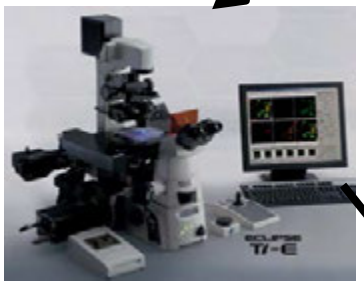


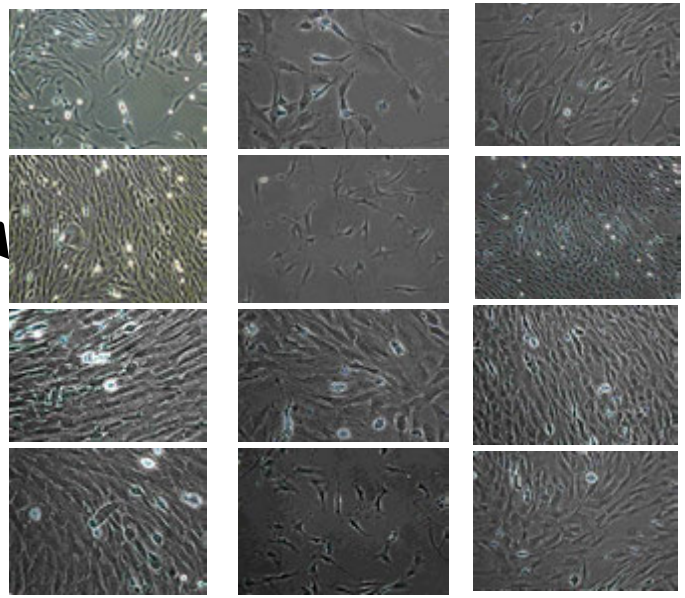


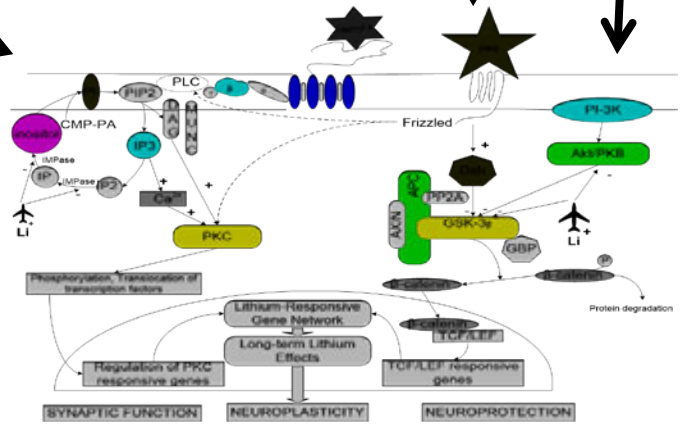








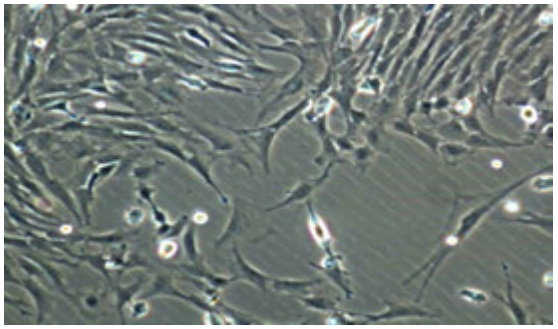
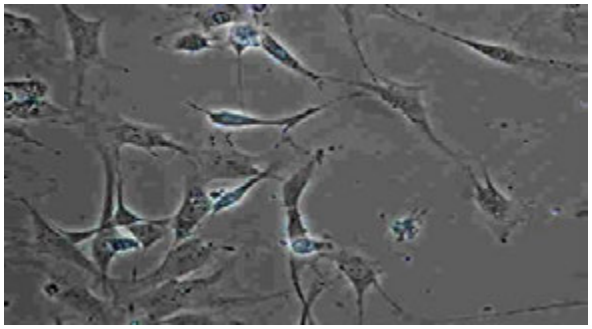
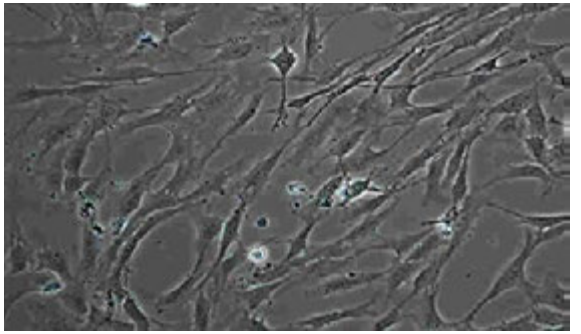
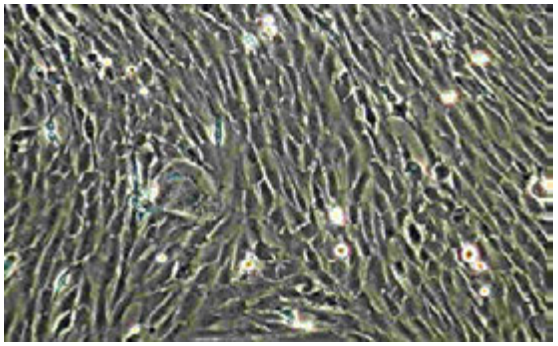
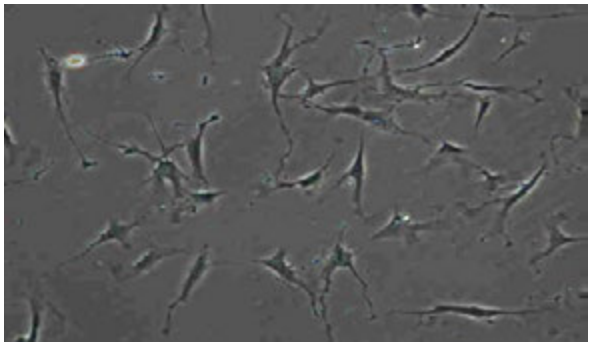
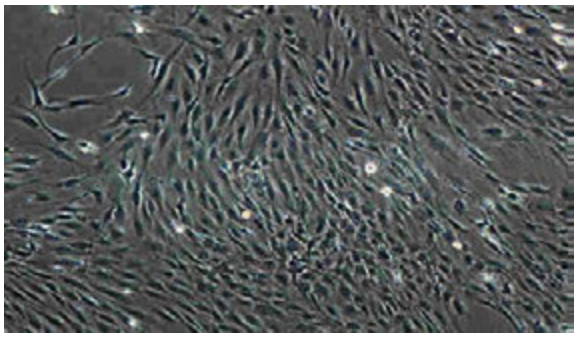
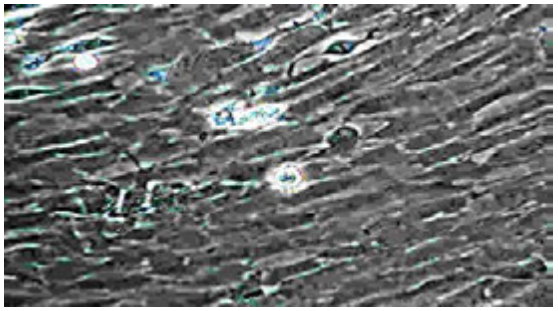
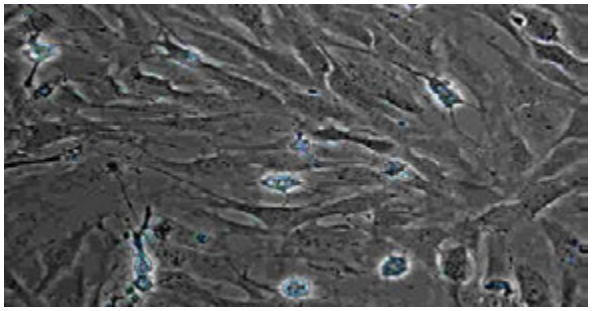
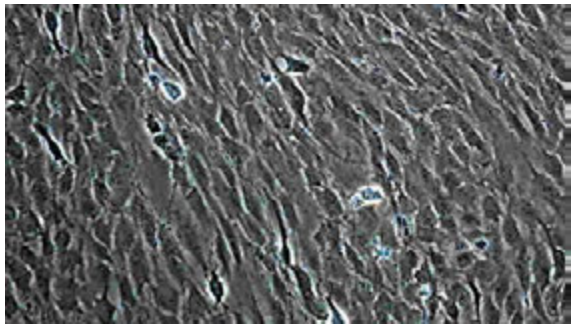
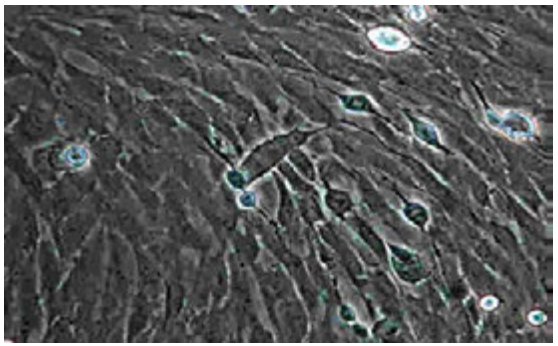
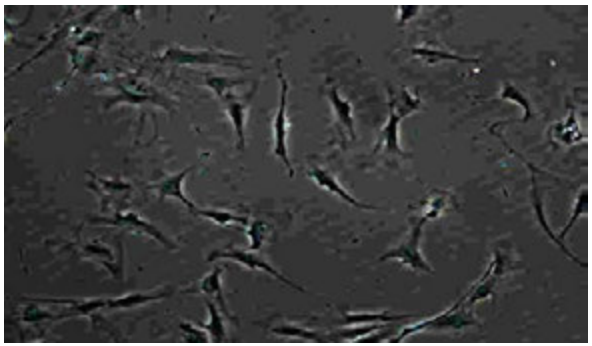
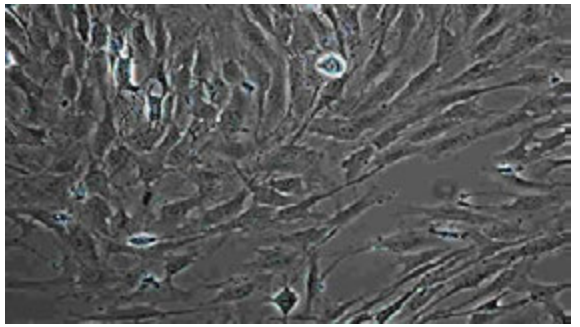



PLC
PIP2
DAG
IP3
CMP-PA
myo-Ins
IMPase
IP2
Ca++
PKC
Li
Frizzled
PI-3K
Akt/PKB
Dsh
PP2A
AXIN
APC
GSK-3β
GBP
β-catenin
Phosphorylation, Translocation of transcription factors
Lithium-Responsive Gene Network
Long-term Lithium Effects
Regulation of PKC responsive genes
TCF/LEF responsive genes
Protein degradation
SYNAPTIC FUNCTION
NEUROPLASTICITY
NEUROPROTECTION

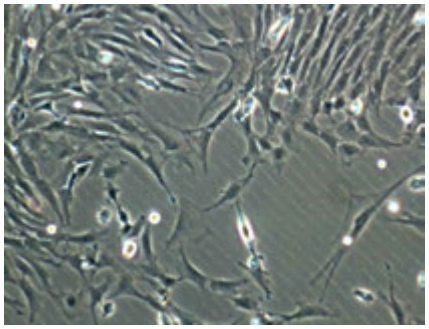
NORMALI (sanatosi clinic)

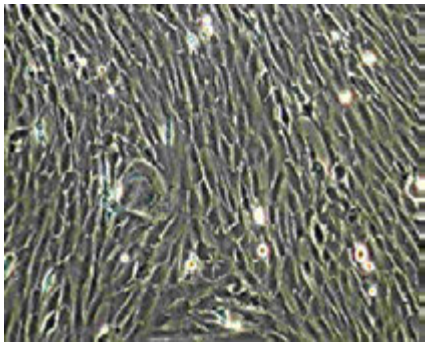
“ASMATICI (ovalbumina)”

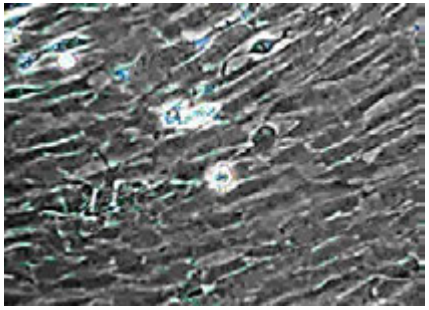
Asmatici tratati in Salina Turda

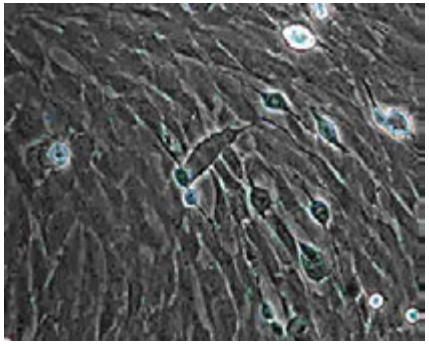













NORMALI (sanatosi clinic)

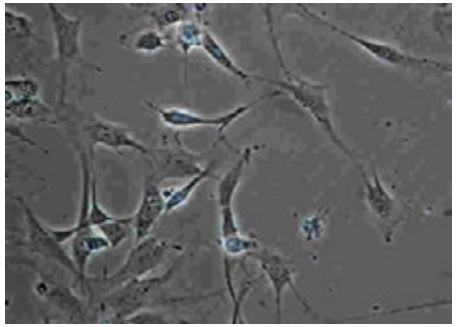


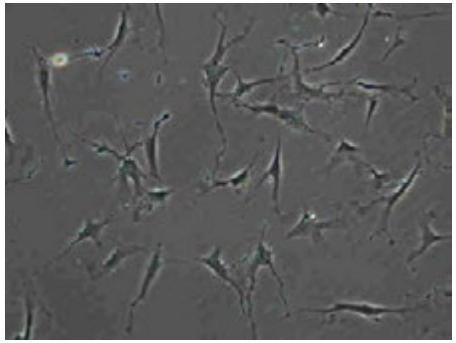


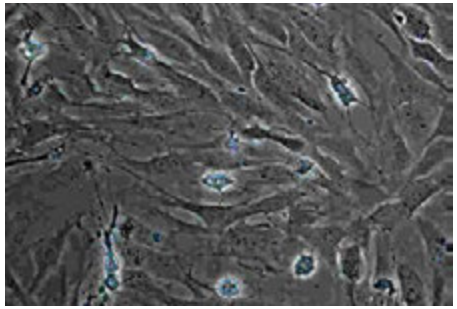


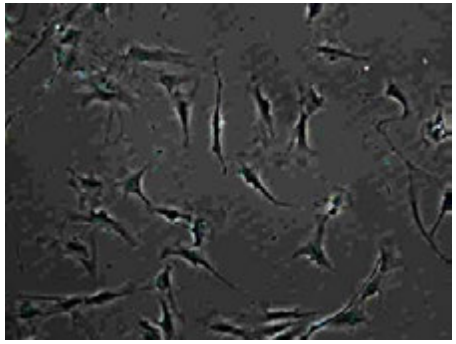


“ASMATICI (ovalbumina)”

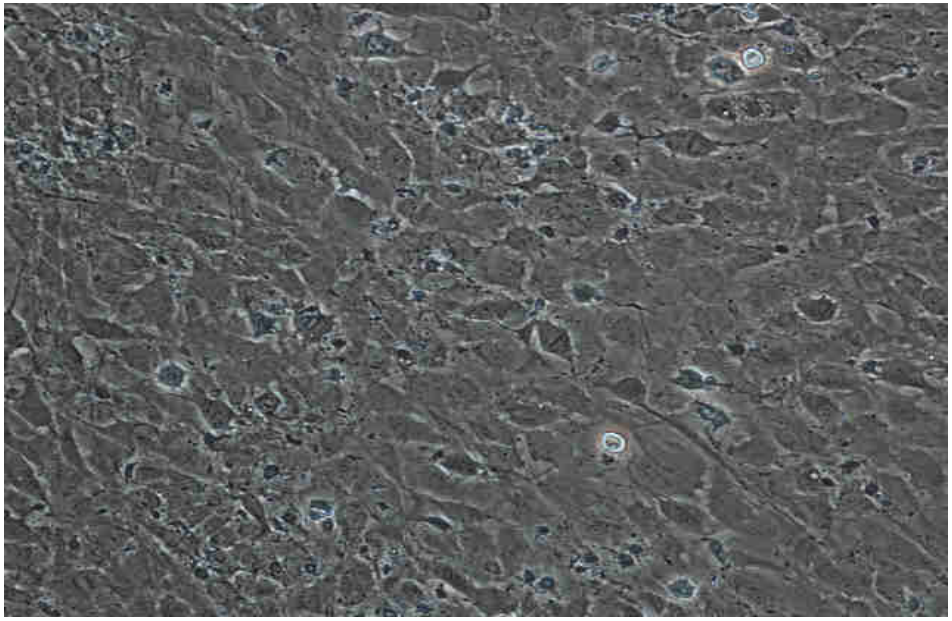


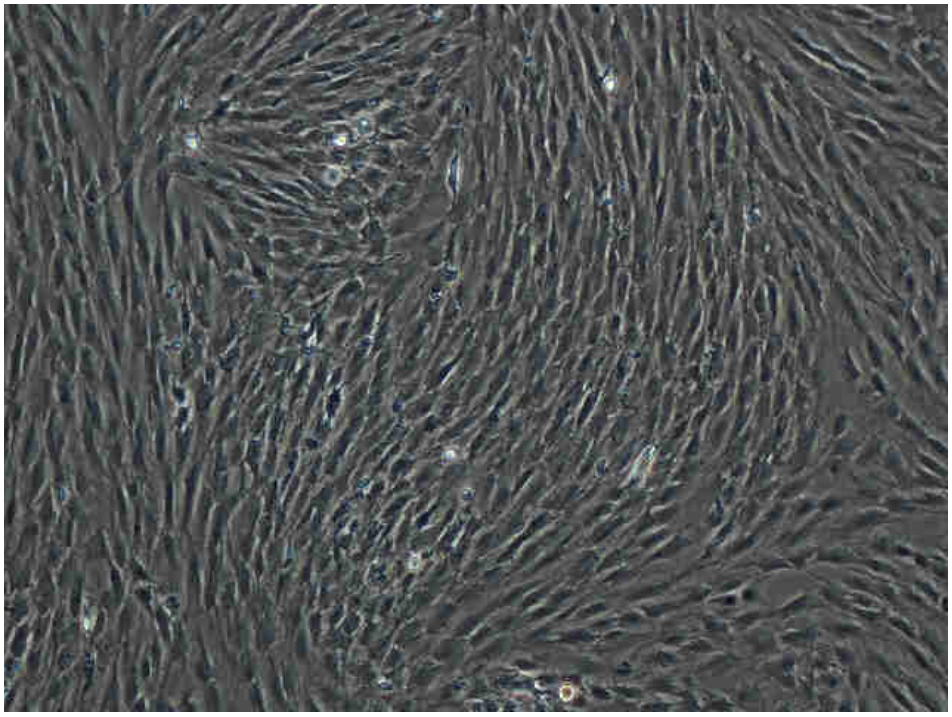




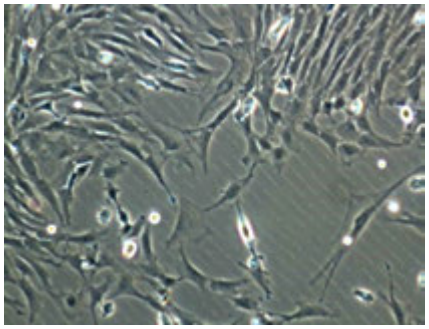


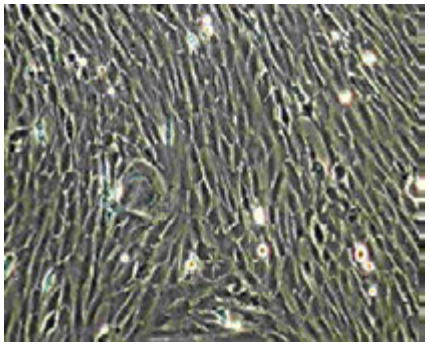
Asmatici tratati in Salina CACICA

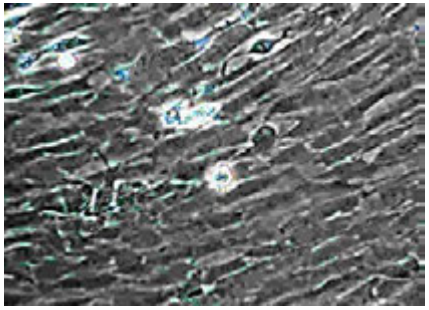


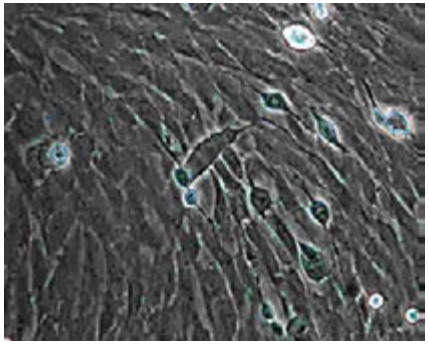


NORMALI (sanatosi clinic)

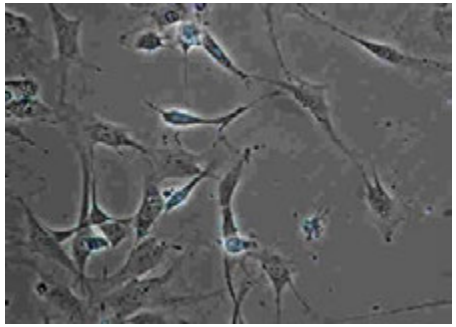


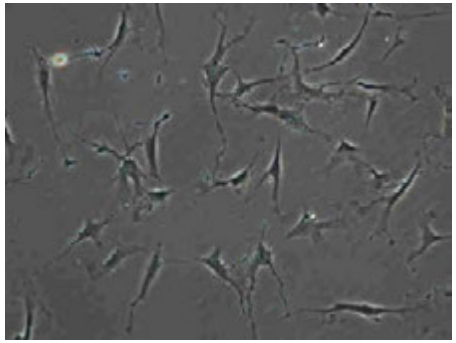


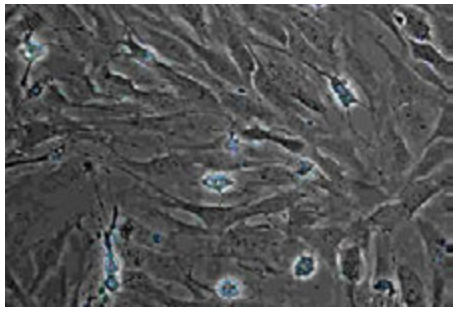


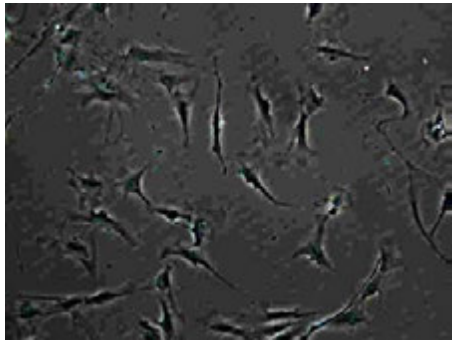


“ASMATICI (ovalbumina)”

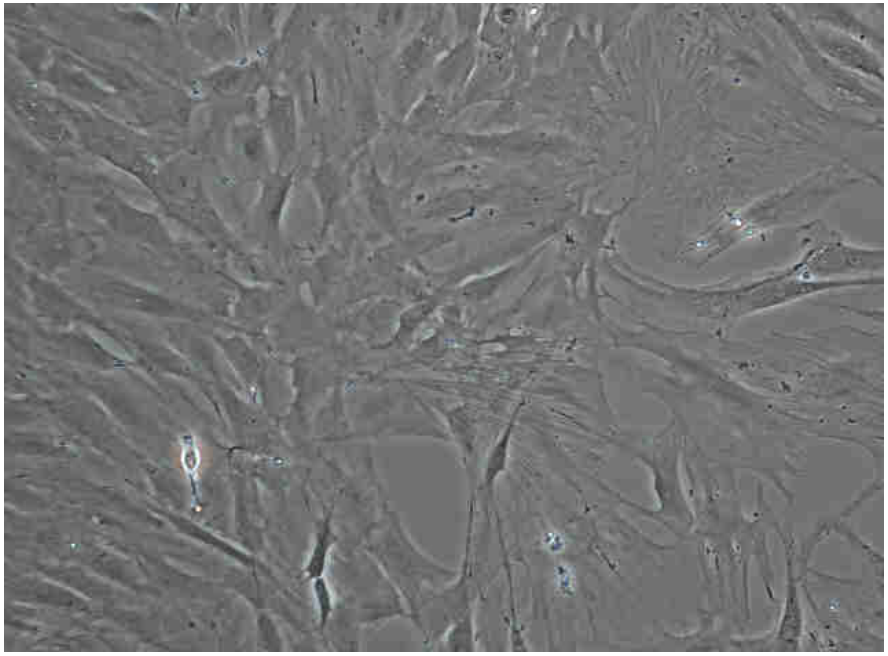








Asmatici tratati in Salina DEJ



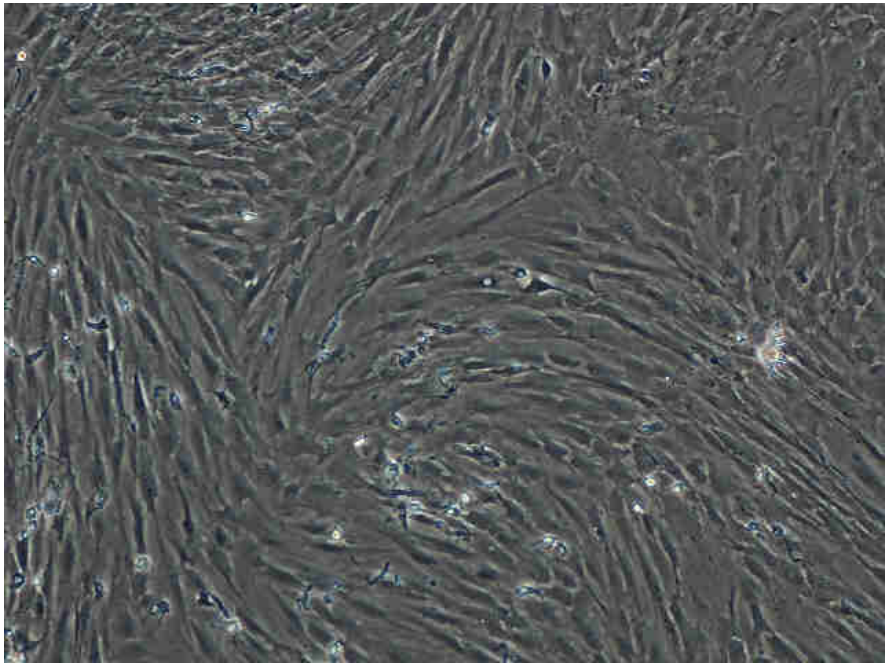
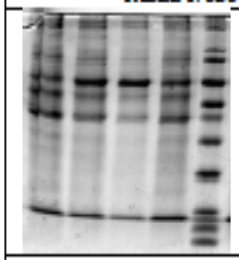
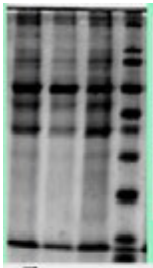


TABLE 1: SDS polyacrylamide gel electrophoresis of the pulmonary fibroblasts cultures



Samples
5- 9 days pulmonary fibroblasts culture from Ovalbumin-sensitised rats exposed to the saline medium of Dej Salt Mine
4- 9 days pulmonary fibroblasts culture from Ovalbumin-sensitised rats exposed to the saline medium of Cacica Salt Mine
3- 9 days pulmonary fibroblasts culture from Ovalbumin-sensitised rats
2- 9 days Control pulmonary fibroblasts culture
1- Sigma molecular markers

Fig. 1 – Electrophoretic profile of pulmonary fibroblasts cultures



PROBA	Cantitatea de proteine per placă
4- cultură de fibroblaste pulmonare expuse mediului din Salina Turda	155 µg
3- cultură de fibroblaste pulmonare obținută de la animale sensibilizate cu ovalbumină	130 µg
2- cultură de fibroblaste pulmonare martor	160 µg
1- markeri de greutate moleculară (SIGMA)	120 µg / 10 µl

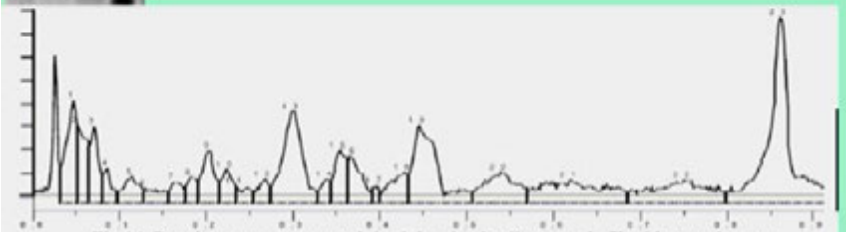


Fig.14 Densitograma omogenatului celular al culturii martor de fibroblaste pulmonare

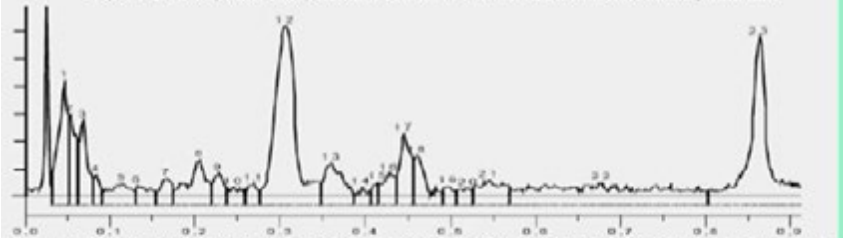


Fig. 15 Densitograma omogenatului celular al culturii de fibroblaste pulmonare obținută de la animale sensibilizate cu ovalbumina

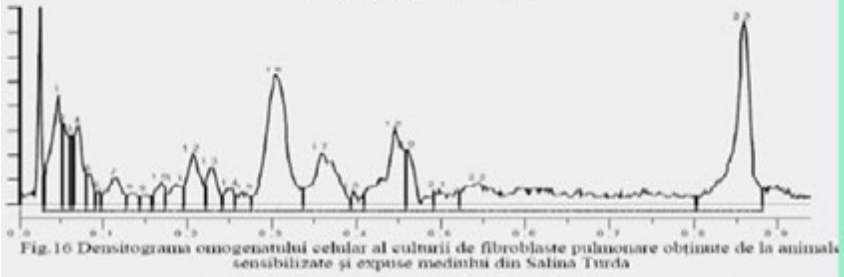


Fig.16 Densitograma omogenatului celular al culturii de fibroblaste pulmonare obținute de la animale sensibilizate și expuse mediului din Salina Turda

Track 2 9 days Control pulmonary fibroblasts culture

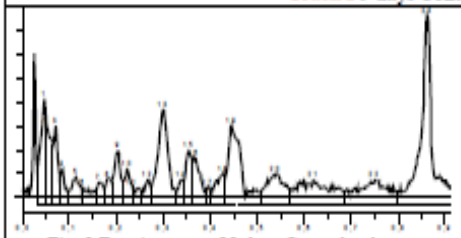


Fig. 2 Densitogram of 9 days Control pulmonary fibroblasts culture

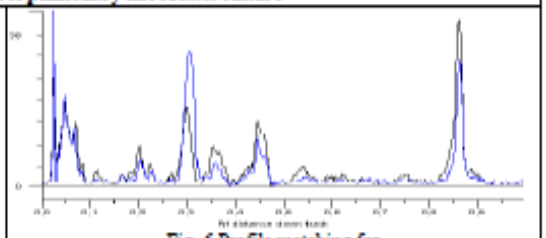


Fig. 6 Profile matching for
CONTROL (▬) – OVALBIMN (▬)

Track 3 9 days pulmonary fibroblasts culture from Ovalbumin-sensitised rats

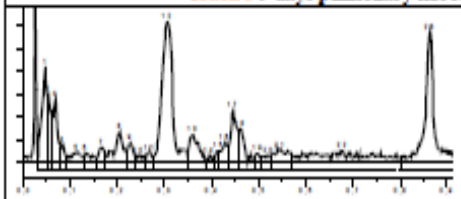


Fig. 3 Densitogram of 9 days pulmonary fibroblasts culture from Ovalbumin-sensitised rats

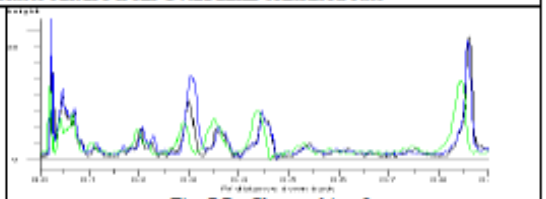


Fig. 7 Profile matching for
CONTROL (▬) - DEJ (▬) - CACICA(▬)

Track 4 9 days pulmonary fibroblasts culture from Ovalbumin-sensitised rats exposed to the saline medium of Cacica Salt Mine

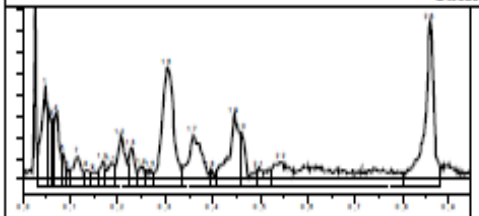


Fig. 4 Densitogram of 9 days pulmonary fibroblasts culture from Ovalbumin-sensitised rats exposed to the saline medium of Cacica Salt Mine

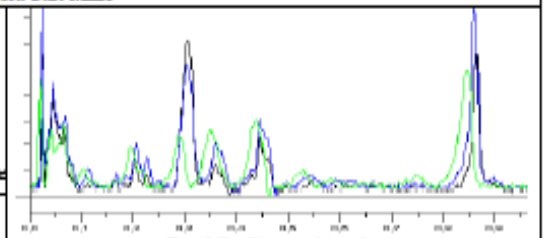


Fig. 8 Profile matching for
OVALBUMIN (▬) - DEJ (▬) - CACICA(▬)

Track 5 9 days pulmonary fibroblasts culture from Ovalbumin-sensitised rats exposed to the saline medium of Dej Salt Mine

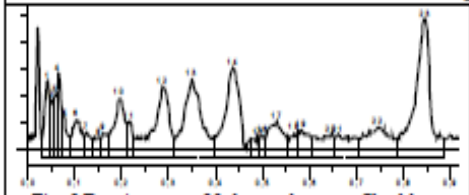


Fig. 5 Densitogram of 9 days pulmonary fibroblasts culture from Ovalbumin-sensitised rats exposed to the saline medium of Dej Salt Mine

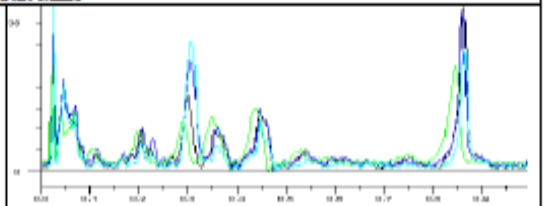
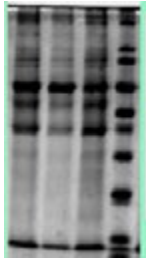


Fig. 9 Profile matching for CONTROL (▬)
OVALBUMIN (▬) - DEJ (▬) - CACICA(▬)

TABLE 2 Protein expression analysis of the pulmonary fibroblasts cultures

Peak Nr.	Peak weights molecular limits (KDa)	CONTROL Quantity (µg/10µl)	OVALBUMIN Quantity (µg/10µl)	CACICA Quantity (µg/10µl)	DEJ Quantity (µg/10µl)
1	225 – 240	5,47	5,18	2,98	6,33
2	220 – 225	3,37	2,35	0,99	2,24
3	210 – 220	2,81	3,08	1,48	1,54
4	200 – 210	1,25	0,56	2,68	3,18
5	190 – 200	1,54	1,23	1,35	1,17
6	160 – 190	0,66	0,65	2,38	0,36
7	140 – 160	0,94	0,90	0,94	2,06
8	120– 140	0,90	2,81	0,70	0,53
9	105 – 120	3,01	1,07	1,00	0,58
10	100 –105	1,58	0,58	4,42	0,98
11	90 – 100	0,59	0,60	1,30	1,34
12	63 – 90	0,94	16,21	8,10	3,38
13	55 – 63	8,77	2,70	10,20	1,96
14	42 –55	0,80	0,34	10,34	0,80
15	40 – 42	2,78	0,39	0,70	0,75
16	37 – 40	2,88	1,38	0,61	14,47
17	35 – 37	0,36	3,11	3,29	6,29
18	34 – 35	2,16	2,16	1,19	0,53
19	32 – 34	8,48	0,44	1,64	7,62
20	30 – 32	3,79	0,55	2,17	2,39
21	23 – 30	4,78	1,86	2,05	1,35
22	19 – 23	4,16	6,64	4,64	12,93
23	6 – 19	18,64	12,62	16,80	15,94
TOTAL amount of proteins in 10 µl of sample:		80,66	67,41	81,95	88,72



PROBA	Cantitatea de proteine per placă
4- culturi de fibroblaste pulmonare expuse mediului din Salina Turda	155 µg
3- culturi de fibroblaste pulmonare obtinută de la animale sensibilizate cu ovalbumină	130 µg
2- culturi de fibroblaste pulmonare martor	160 µg
1- markeri de greutate moleculară (SIGMA)	120 µg / 10 µl

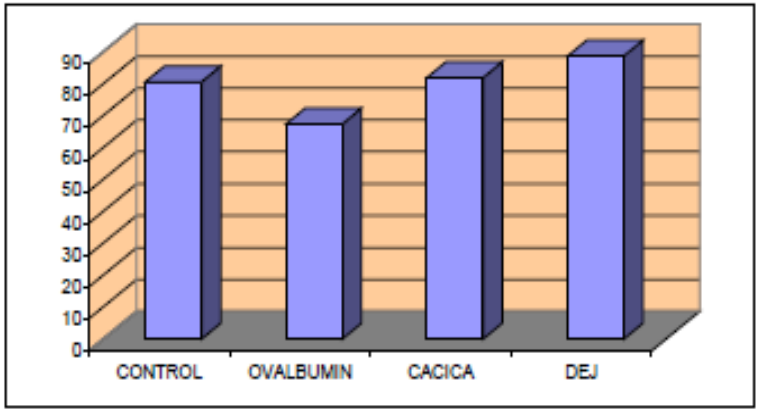
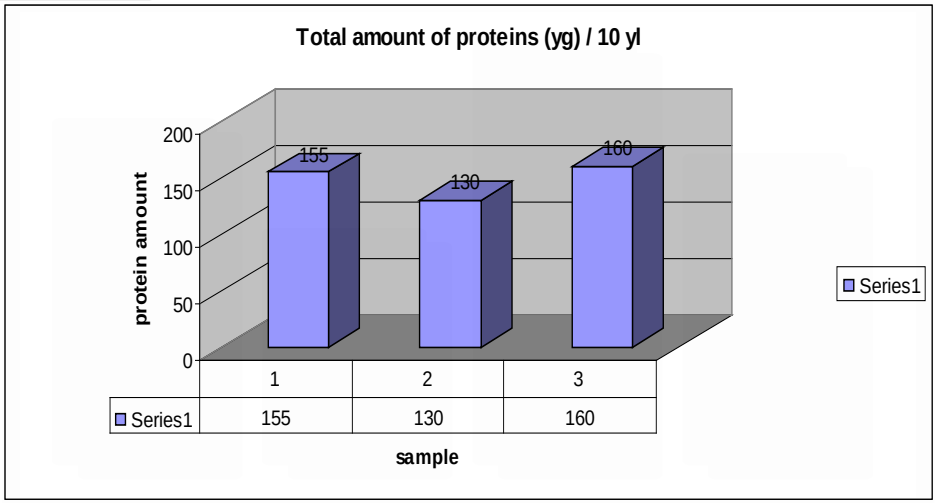


Fig.10 **TOTAL amount of proteins in 10 µl of sample**



Conclusions

Phase contrast microscopy analyses of primary fibroblasts cultures reveals an cellular regeneration after animal exposure to saline medium in Turda, Cacica and Dej Salt Mines, comparative with the cells morphology of cultures from Ovalbumin sensitised rats.

The morphological observations are confirmed by the electrophoretic analyses, which demonstrate through rising of the expression of many proteins and of total protein amount that the exposure of Ovalbumin-sensitised animals to the saline medium from Turda, Cacica and Dej Salt Mines is reversing the cells morphopathology of pulmonary fibroblasts in cultures;

Wistar rats sensitised with Ovalbumin have a low number pulmonary fibroblasts output cultures, with a more sensitive morphopatologic level.

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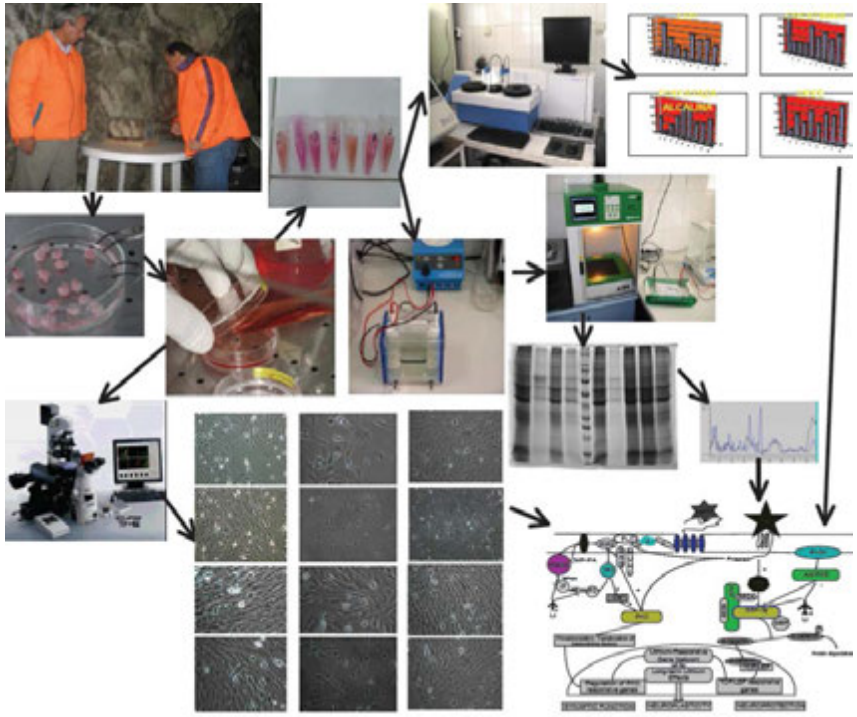
English Edition

Munteanu C., Munteanu D., Simionca I., Cinteza D., Hoteteu M.;

Exploration of the speleotherapeutic potential through the cellular and molecular biology techniques

Abstract

Objective: **Exploring the speleotherapy effects on morphology and physiology of dermal and pulmonary fibroblast obtained from Wistar rats tissue in normal conditions and after induction of experimental "astma" awareness with ovalbumin.**



Materials and methods:

Dermal and pulmonary fibroblast cultures were initiated by enzymatic techniques from appropriate tissue taken of each group Wistar rats. Morphological monitoring was done by phase contast microscopy; biochemical and molecular changes of cultures obtained from animals treated speleothropic compared to control, was experimental establised by electrophoresis and Western Blotting techniques.

Results: **Experimental data revealed the expression of several proteins after the speleotherapeutic treatment. These data were analysed compared with control, using a specific software.**

Conclusions: **Speleotherapeutic treatment of Wistar rats caused significant differences in morphology and protein expression of dermal and pulmonary fibroblatst grown in the laboratory. These differences support the protective effects of speleotherapy compared with data obtained from animals untreated and sensitized with ovalbumin, having induced experimental asthma status.**

Glial effects of the lithium mineral water Maria from Malnas-Bai

Constantin MUNTEANU, MBiol[a], Gabriela ZAMFIRESCU, PhD[a], Diana MUNTEANU, MBiol[a], Delia CINTEZA, MD PhD[b]

ABSTRACT

Objective: *To investigate the influence of lithium mineral waters and lithium salts upon the differentiation of glial cells.*

Material and methods: *Mixed glial cultures were prepared from neonatal Wistar rat cortex. Cultures derived from neonatal rat forebrain develop with a monolayer or large flat astrocytes attached to the culture dish, with many smaller cells of the oligodendrocytes lineage on their surface.*

Results: *Treatment of these cultures with lithium mineral waters from Maria spring compared to treatment with lithium chloride 2mM showed significant differences in cell morphology. Immunohistochemical studies for glycogen synthase kinase (GSK)-3β supported the protective effects of lithium mineral waters for glial cells, whereas lithium chloride 2mM determined cytotoxic effects and inhibited Wnt signalling pathway.*

Conclusions: *The results of this study indicate the fact that lithium chloride and lithium mineral waters induce changes in glial cells. The changes depend on the lithium level in the culture medium.*

Key words: lithium, glial cells, GSK-3β, GFAP, Laminin, Vimentin

	Content in 1 litre of mineral water				
	mg	mM	mEq	mg %	mEq %
ANIONS					
Cl^-	1.009,1	28,460	28,460	10,922	24,866
Br^-	2,,9	0,036	0,036	0,031	0,032
I^-	0,7	0,006	0,006	0,008	0,017
NO_3^-	9,9	0,160	0,160	0,107	0,139
SO_4^-	25,1	0,261	0,261	0,272	0,457
HCO_3^-	5202,0	85,256	85,256	56,304	74,489
			114,455		100,000
CATIONS					
Na^+	2263,8	98,441	98,441	24,503	86,009
K^+	70,5	1,803	1,803	0,763	1,575
Li^+	8,03	1,152	1,152	0,087	1,007
NH^+	0,70	0,039	0,039	0,008	0,034
Ca^{2+}	212,6	5,304	5,304	2,301	9,269
Mg^{2+}	28,3	1,164	1,164	0,306	2,033
Fe^{2+}	2,2	0,039	0,039	0,024	0,070
Mn^{2+}	0,1	0,002	0,002	0,001	0,003
			114,455		100,000
H_2SiO_3	21,5	0,275		0,233	
HBO_2	372,2	8,492	-	4,029	-
NH_2	7,0	0,437		0,076	
O_2	2,4	0,150		0026	
CO_2	748,0	17,000			
Mineralization	9239,0	231,477	228,909	100	

TABLE 1. Chemical content of Maria mineral water

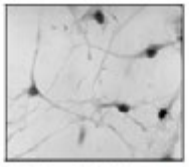


Fig 1. *Glial cells culture after 20 days, hematoxylin-eosin, x400*

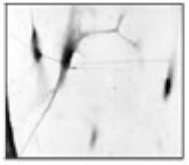


Fig 2. *Glial cells after treatment with Mary mineral water for 20 days, hematoxylin-eosin, x400*

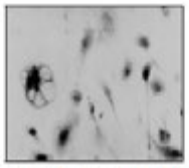


Fig 3. *Vacuolized glial cell after treatment with 2mM LiCl for 10 days, hematoxylin-eosin, x250*

GSK-3β expression after treatment of glial cells with lithium and Maria lithium mineral water from Malnas-Bai

Constantin MUNTEANU, MBiol[a]; Diana MUNTEANU, MBiol[a]; Delia CINTEZA, MD, PhD[b]
[a]National Institute of Rehabilitation, Physical Medicine and Balneoclimatology, Bucharest, Romania
[b]"Carol Davila" University of Medicine and Pharmacy, Bucharest, Romania

ABSTRACT

Objective: *To investigate the influence of lithium mineral waters and lithium salts upon the expression of GSK-3β in glial cells.*

Materials and methods: *Mixed glial cultures were prepared from neonatal Wistar rat cortex. Cultures derived from neonatal rat forebrain develop with a monolayer or large flat astrocytes attached to the culture dish, with many smaller cells of the oligodendrocytes lineage on their surface.*

Results: *Treatment of these cultures with lithium mineral waters from Maria spring compared to treatment with lithium chloride 2mM showed significant differences in cell morphology. Immunohistochemical studies for glycogen synthase kinase (GSK)-3β supported the protective effects of lithium mineral waters for glial cells, whereas lithium chloride 2mM determined cytotoxic effects and inhibited Wnt signalling pathway.*

Conclusions: *The results of this study indicate the fact that lithium chloride and lithium mineral waters induce changes on the expression of GSK-3β.*

Key words: glial cells, GSK-3β, lithium, lithium mineral water, Malnas-Bai

FIGURE 24. Immunoblotting profile for GSK-3β
1. CONTROL, 2. MARIA 50%, 3. MARIA 25%, 4. MARIA 25% + Li 1 mM, 5. Li 1 mM, 6. Li 2 mM, 7. S 50%, 8. S 25%, 9. S25% + Li 1mM

High	Raw vol.	Quantity (µg)	%
Track 1 CONTROL			
2,422	813,74	0,29	6,99 %
Track 2 MARIA 50%			
0,388	28,30	0,01	0,37 %
Track 3 MARIA 25%			
4,404	1311,68	0,43	13,78 %
Track 4 MARIA 25% + LiCl 1 mM			
1,718	274,72	0,09	3,63 %
Track 5 LiCl 1 mM			
3,945	1347,42	0,13	4,11 %
Track 6 LiCl 2 mM			
0,507	95,57	0,01	0,50 %
Track 7 S 50%			
4,389	1180,06	0,39	9,85 %
Track 8 S 25%			
3,640	854,72	0,28	4,53 %
Track 9 S 25% + LiCl 1 mM			
2,171	604,24	0,21	6,01 %

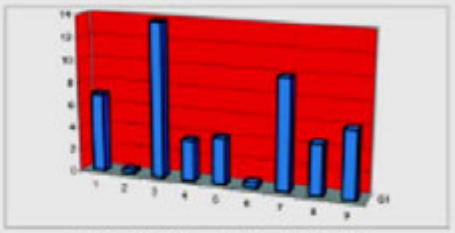
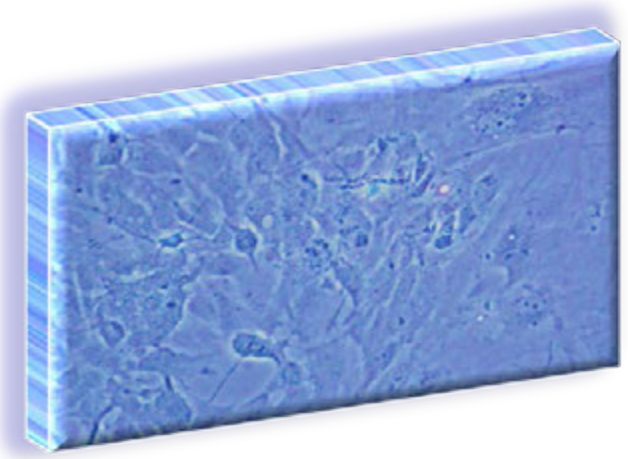
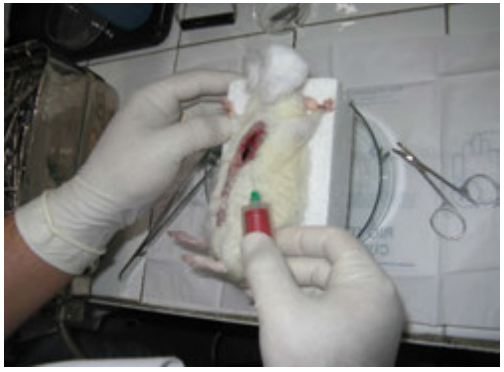
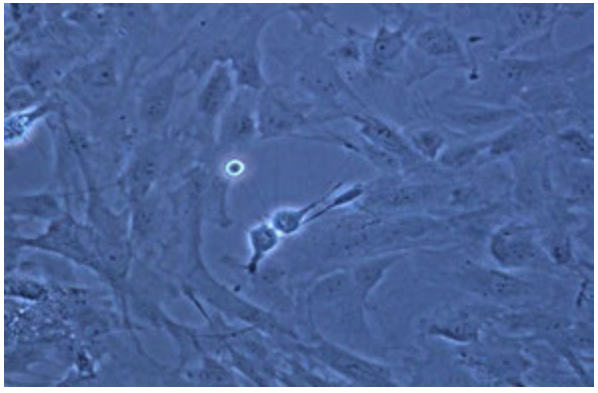


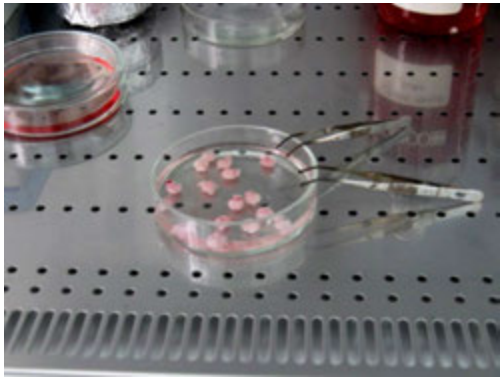
FIGURE 25. Expression level of GSK-3β
1. CONTROL,
2. MARIA 50%,
3. MARIA 25%,
4. MARIA 25% + Li 1 mM,
5. Li 1 mM,
6. Li 2 mM
7. S 50%
8. S 25%
9. S25% + Li 1mM

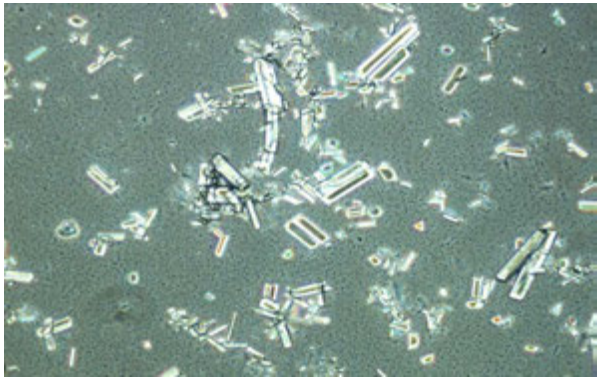
Studii Avansate la nivel celular si molecular





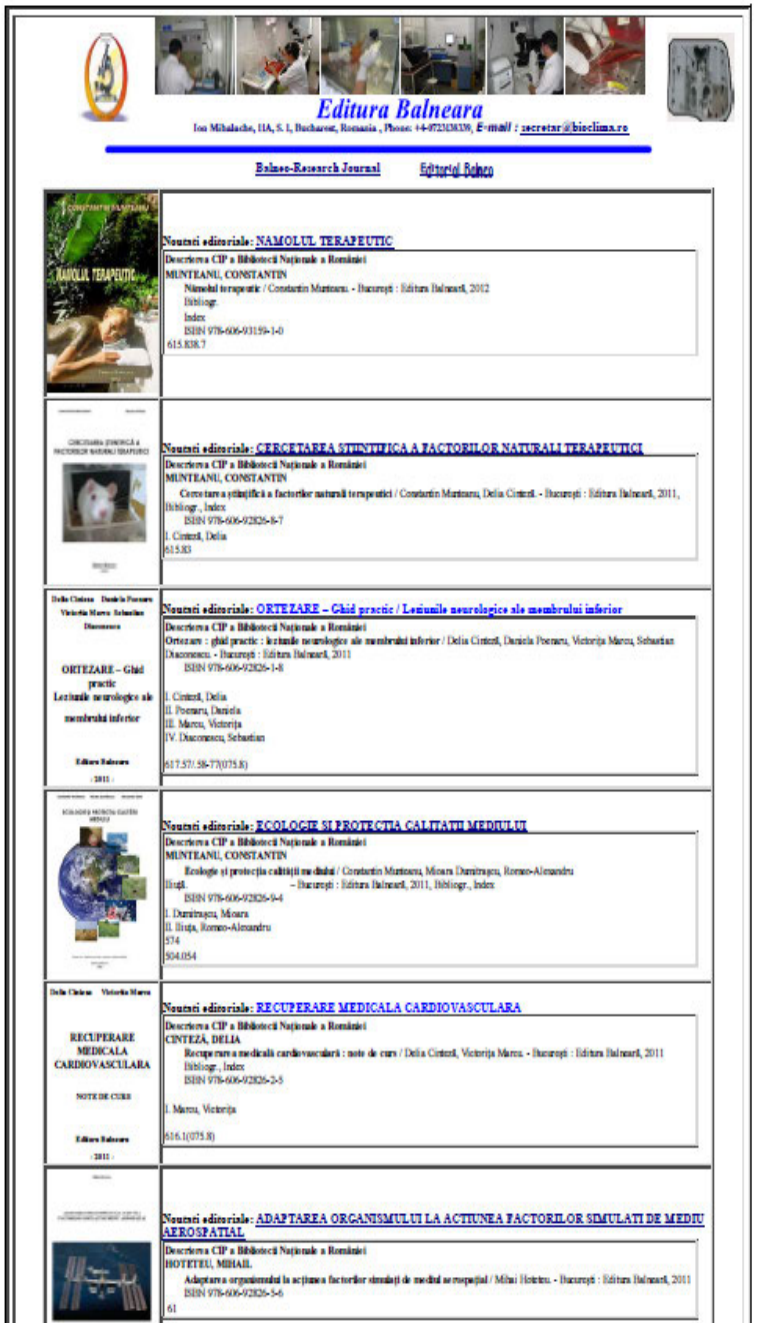






Studiile celulare si moleculare permit evaluarea modificarilor morfologiei celulare, sintezei proteice, secretia anumitor substante, modificarea metabolismului celular, interactiunea receptorilor celulari cu diferite semnale chimice din mediu, diviziunea celulara si alte procese fiziologice sub influenta directa a factorilor naturali terapeutici introdusi in mediul de cultivare a celulelor.

Asociatia Romana de Balneologie / Romanian Association of Balneology



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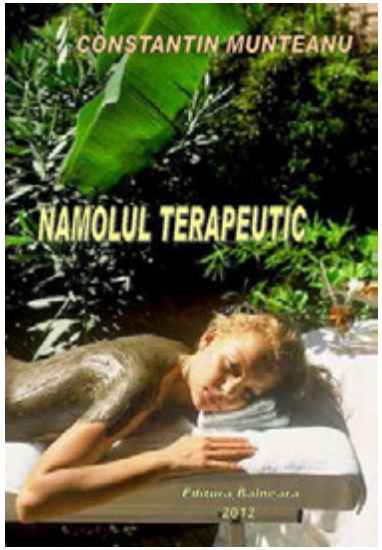

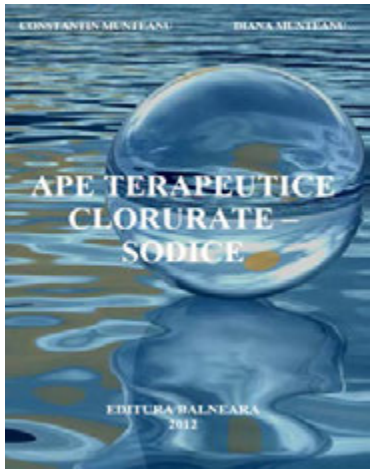

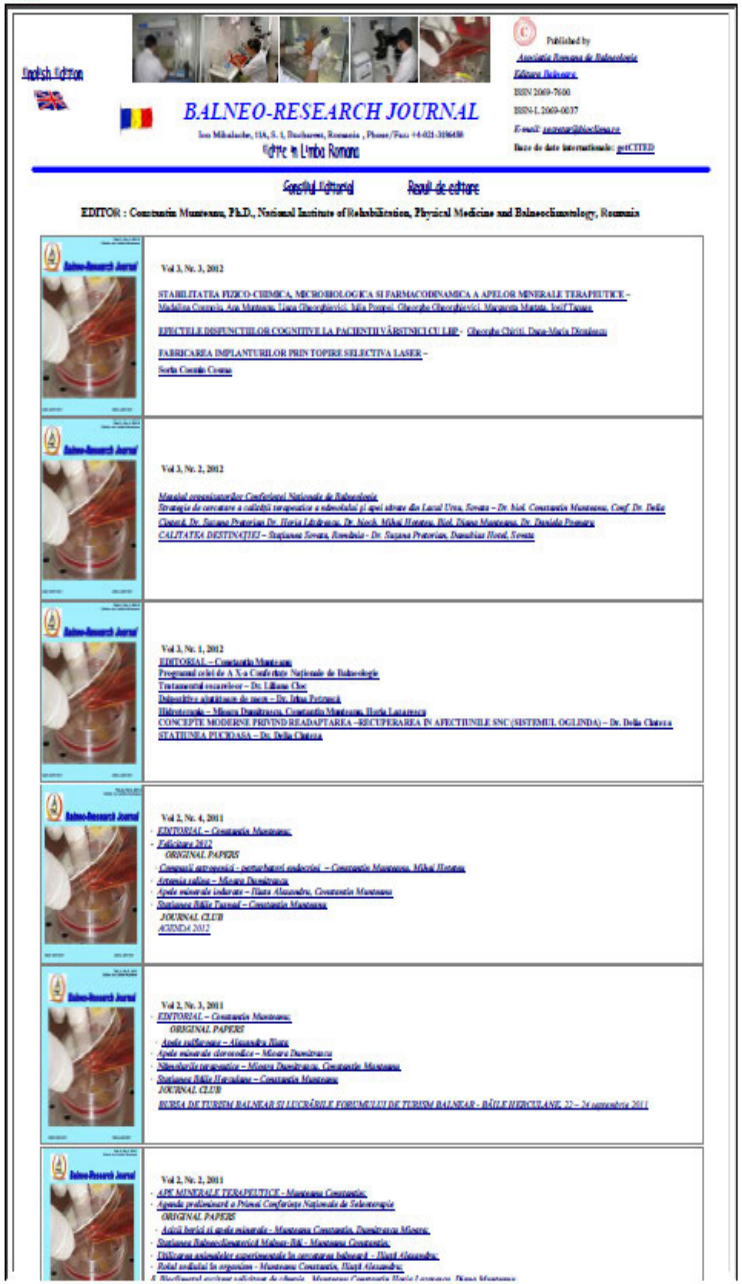

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TOP 10 Balneo Resorts of Romania

TOP 10 Statiuni Balneare

No.	Statiunea BALNEARA	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	Total
1	Techirghiol	7	8	8	8	8	7	5	5	6	8	70
2	Băile Felix	7	7	8	7	6	7	7	7	7	6	69
3	Băile Tuşnad	6	8	7	7	7	7	6	7	7	6	68
4	Sovata	6	5	7	7	7	7	7	7	5	7	65
5	Băile Herculane	6	5	6	6	7	6	7	7	6	6	64
6	Covasna	5	5	6	6	7	6	6	5	5	6	57
7	Slănic Moldova	5	5	5	5	6	6	6	6	6	6	56
8	Călimăneşti-Căciulata	5	4	6	6	6	5	5	6	6	6	55
9	Neptun	7	4	6	5	5	4	7	5	6	5	54
10	Amara	5	4	5	6	5	5	5	5	5	5	50

Criterii de evaluare:

1. Accesibilitate, infrastructura, patrimoniu public, management urbanistic, implicarea autoritatilor locale:
2. Existenţa unor structuri de educaţie şi cercetare, prezenţa unui personal universitar în staţiune, existenţa unui nucleu de cercetare ştiinţifică;
3. Notorietatea externă: spoturi video în engleza, situri web în engleză, participarea la targuri internaţionale, articole ştiinţifice în limba engleză, participarea la evenimente internaţionale, legaturi externe, tour-operatori intarnţionali, investitori externi;
4. Notorietatea internă a staţiunii: organizarea unor evenimente specifice promovarii sectorului balnear, participarea la targuri interne de turism, articole şi materiale de promovare în limba română, situri de promovare;
5. Calitatea certificata a factorilor naturali de cură utilizaţi în staţiunea balneară analizată;
6. Calitatea serviciilor turistice şi medicale din cadrul staţiunii balneare analizate, nivelul de calificare a resurselor umane, prezenţa animatorilor de staţiune;
7. Strategii de dezvoltare a staţiunii identificate prin planuri ale autorităţilor locale şi ale operatorilor din staţiunea balneară analizată;
8. Nivelul investiţiilor în baze de tratament şi unităţi de cazare la nivelul staţiunii balneare analizate;
9. Disponibilitate la dialog a factorilor de decizie locali şi a investitorilor / operatorilor economici din staţiune;
10. Premii ştiinţifice, medalii, menţionări ale staţiunii în documente ale autorităţilor centrale, vizibilitate a nivelului de excelenţă al staţiunii balneare analizate.

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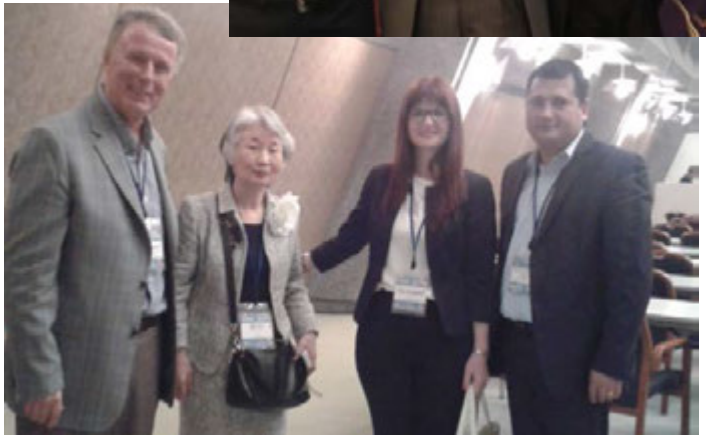


41st ISMH WORLD CONGRESS

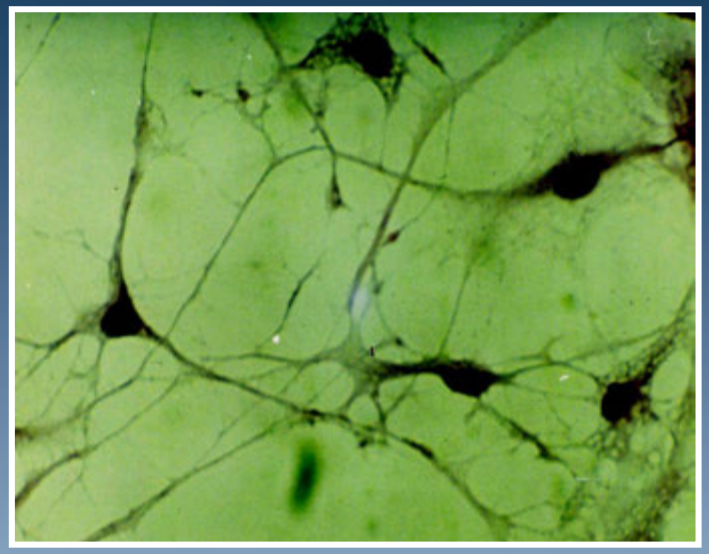
BUCHAREST România 19th - 21st May, 2016

For health….

For beauty …..

Romanian Association of Balneology

THANK YOU !



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