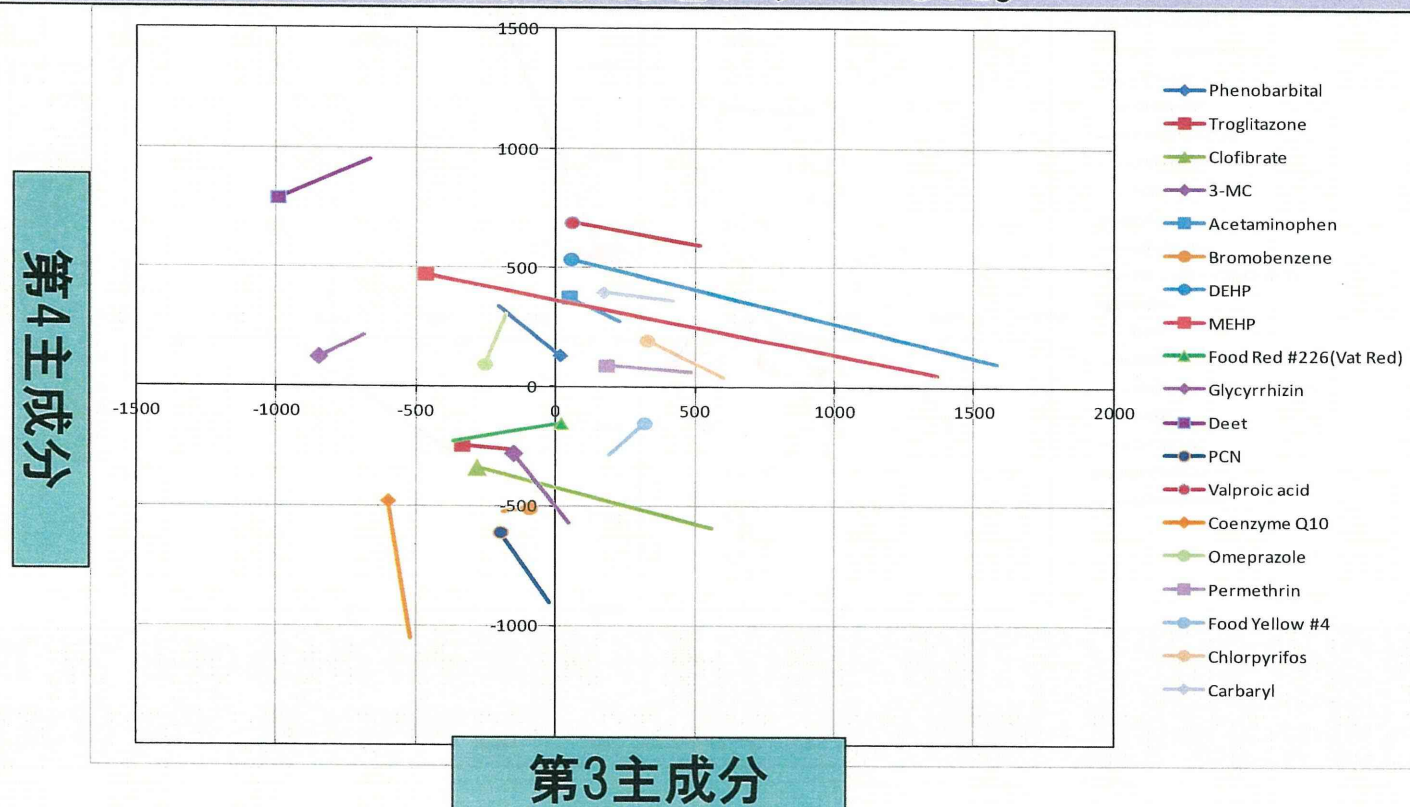


4.4.2.主成分分析結果

溶媒群および、最大Dose同士の距離を求め、座標に割り当てた後、主成分分析を実施した。その第3成分と第4成分をグラフにした。

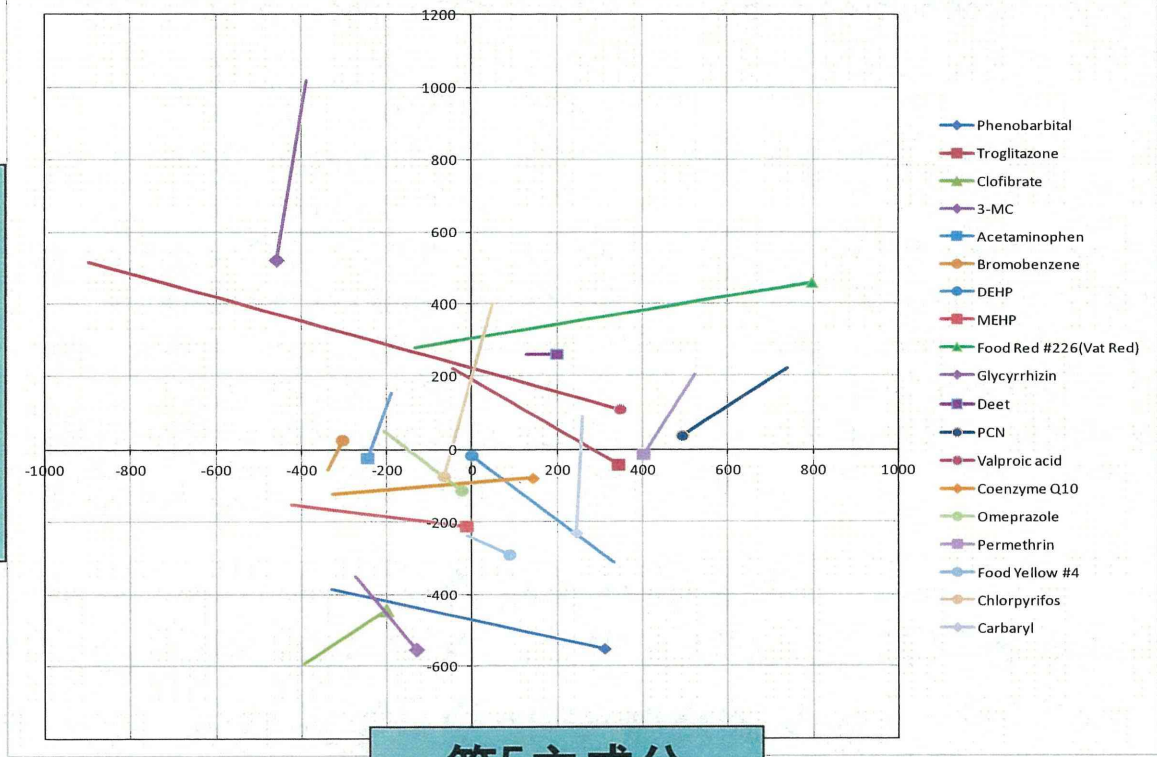


第3主成分は、MEHP、DEHP、Clofibrate、Valproic Acidなどの反応を表しているように思われる。第4主成分は、プロジェクト間の違いを表しているように思われる。

4.4.3.主成分分析結果

溶媒群および、最大Dose同士の距離を求め、座標に割り当てた後、主成分分析を実施した。その第1成分と第2成分をグラフにした。

第6主成分



第5主成分

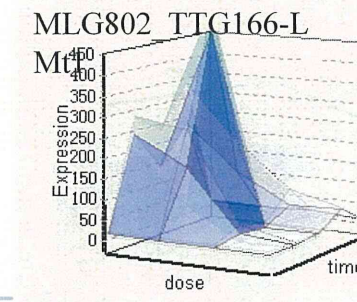
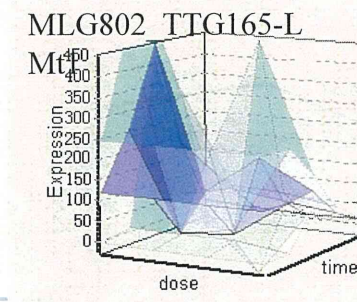
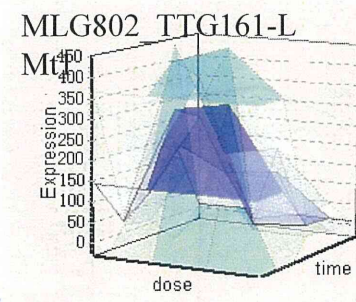
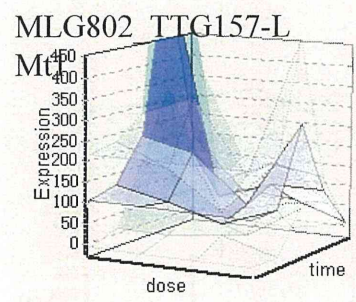
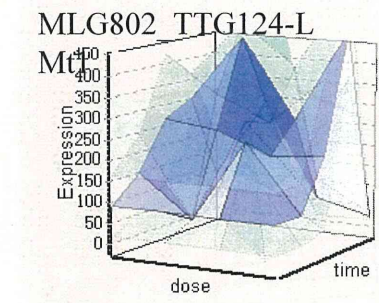
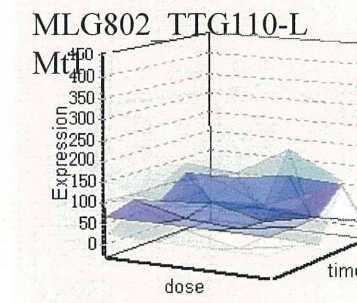
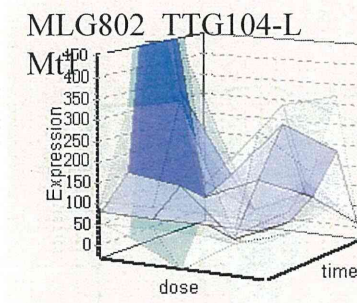
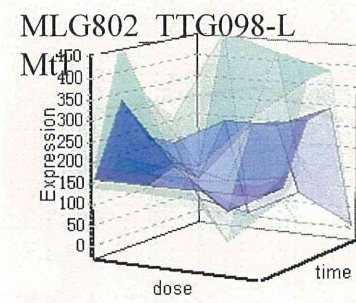
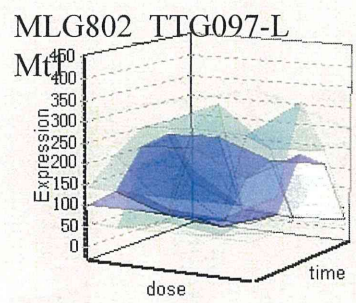
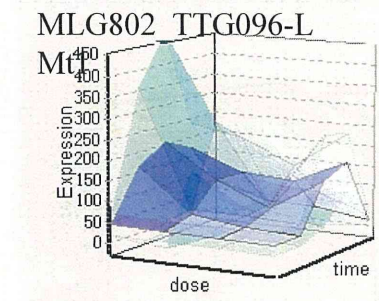
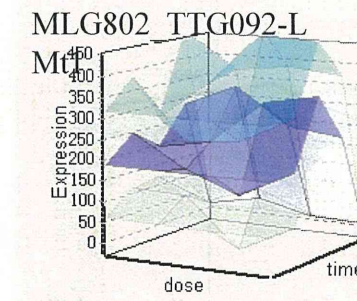
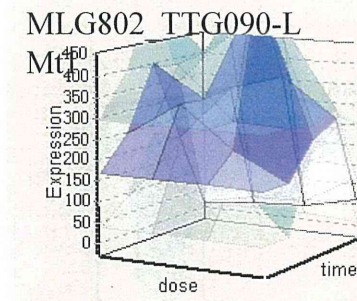
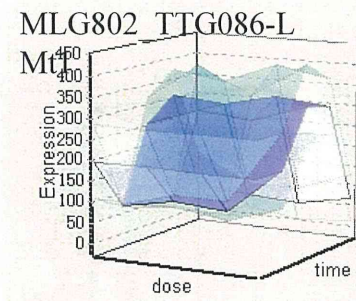
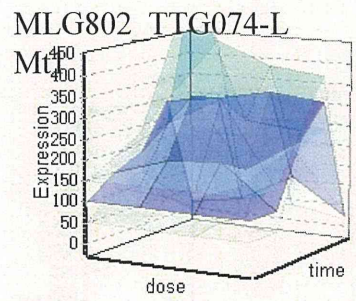
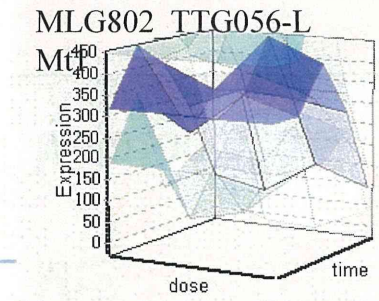
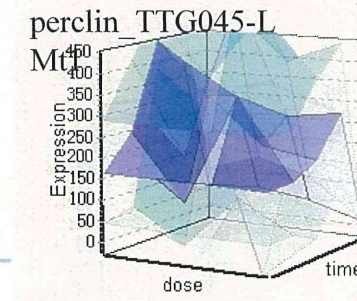
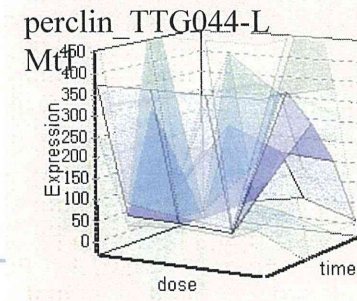
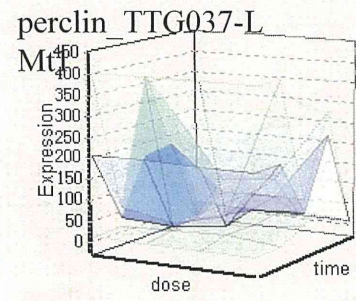
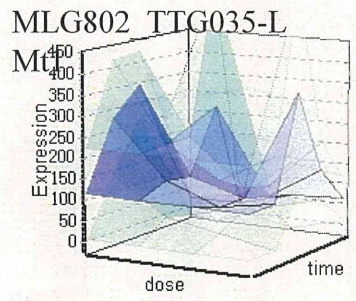
第5主成分は、Valproic Acid、Food Red #226、Phenobarbitalなどの反応を表しているように思われる。第6主成分は、3-MC、Chlorpyrifos、Carbarylなどの反応を表しているように思われる。

4.5.各溶媒群の距離を生み出す遺伝子群

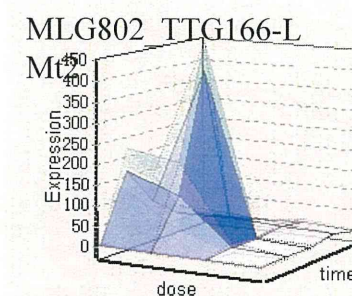
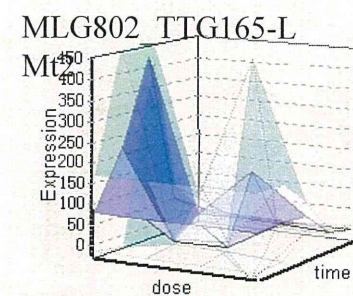
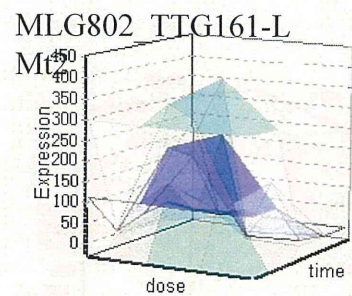
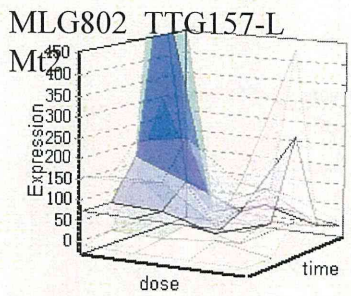
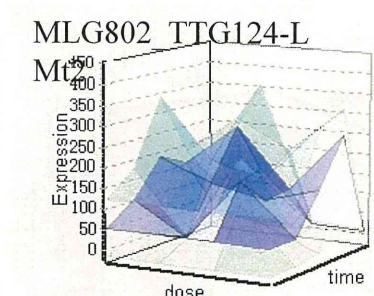
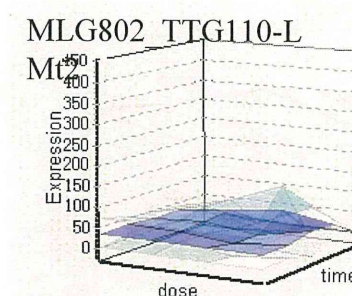
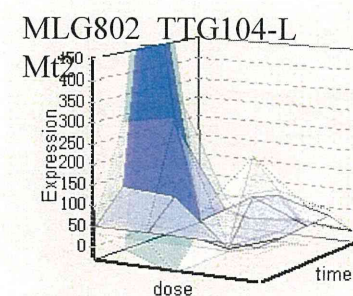
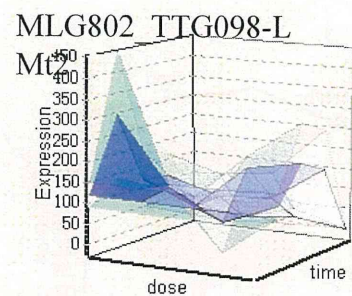
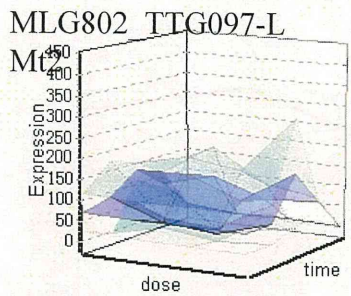
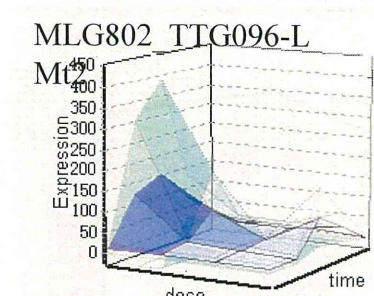
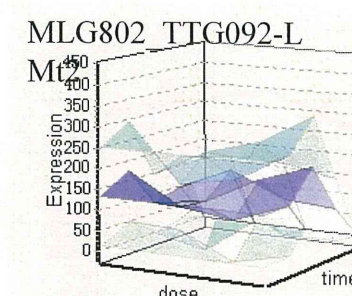
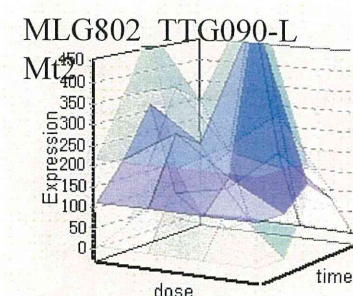
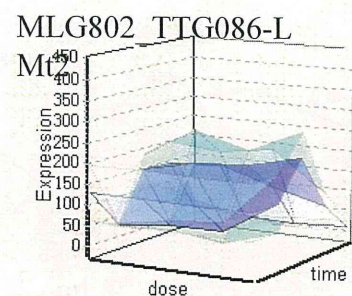
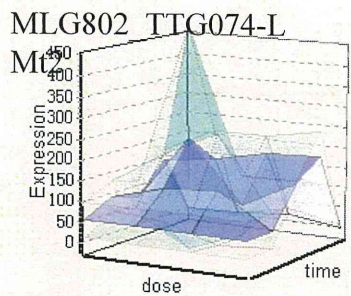
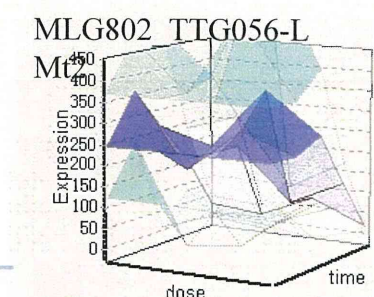
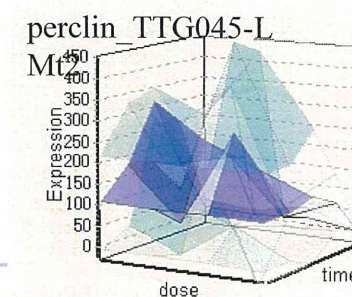
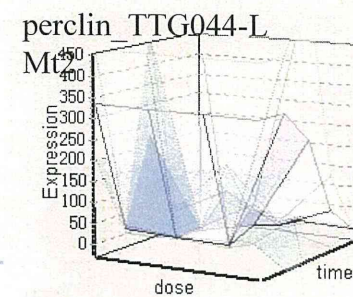
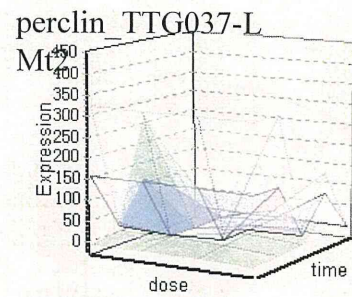
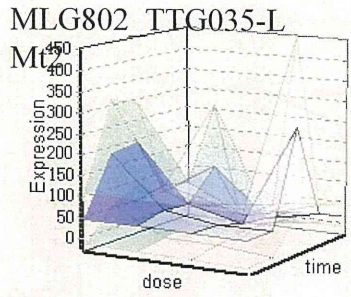
溶媒群同士で、距離が大きく、化合物影響が大きく表れていない。このような状況を生み出している遺伝子を見つけ出すために、全溶媒群間の距離が大きな順に遺伝子を並べ、それぞれの状況を確認する

順位	距離合計	ProbesetID	Gene Symbol	Description
1	13,123,615	1422557_s_at	Mt1	Melatonin receptor 1
2	7,977,142	1428942_at	Mt2	Melatonin receptor 2
3	4,230,127	1431213_a_at	Gm3579	
4	4,048,761	1415965_at	Scd1	ステアロイル-CoA不飽和化酵素1
5	3,499,390	1426166_at	Mup5	Major Urinary protein 5
6	3,135,199	1424853_s_at	Cyp4a10	Lauric acid omega-hydroxylase
7	3,055,755	1460256_at	Car3	脱炭酸酵素
8	2,997,376	1426088_at	Gm4076	
9	2,759,092	1415964_at	Scd1	ステアロイル-CoA不飽和化酵素1
10	2,666,517	1452757_s_at	Hba-a1 /// Hba-a2	Hemoglobin alpha1 /// Hemoglobin alpha 2
11	2,658,265	1451557_at	Tat	tyrosine aminotransferase
12	2,619,513	1449321_x_at	Serpina1a	Alpha-1 protease inhibitor 1
13	2,529,704	1424599_at	Fgl1	Fibrinogen-like protein 1

次ページより、各遺伝子のサーフェースを確認する

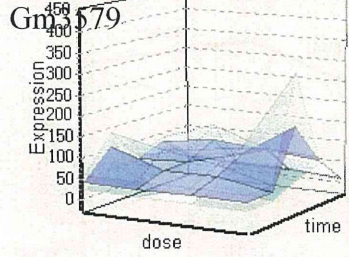


Mt1
Melatonin関連

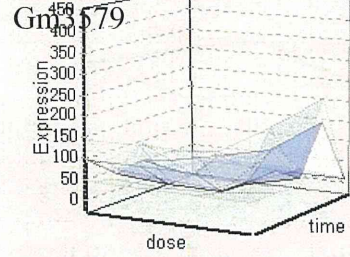


Mt2
Melatonin関連

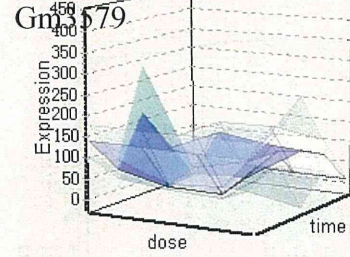
MLG802 TTG035-L



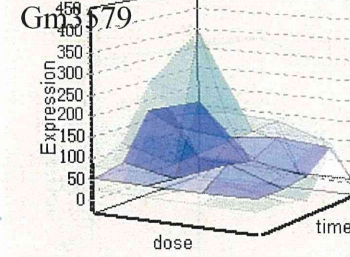
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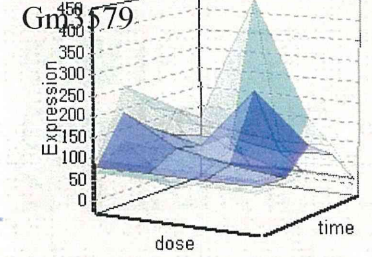
perclin TTG044-L



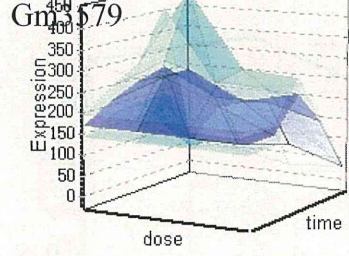
perclin TTG045-L



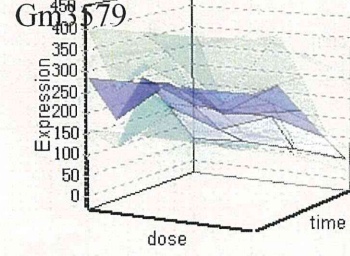
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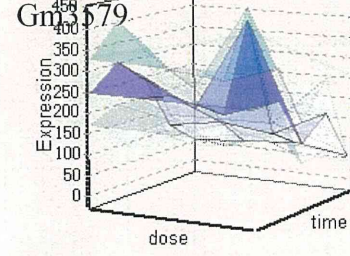
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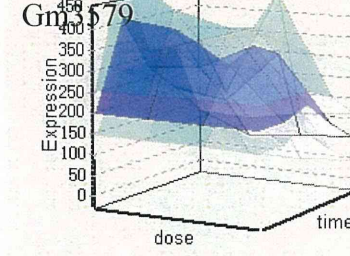
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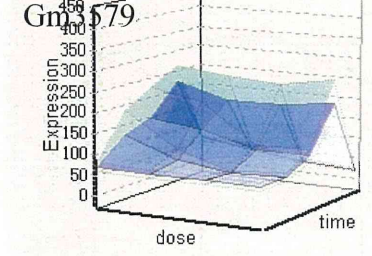
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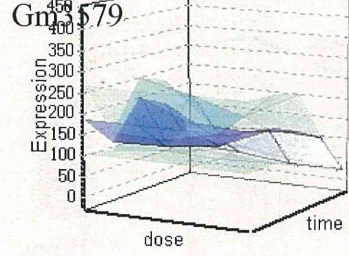
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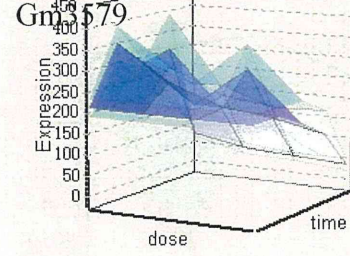
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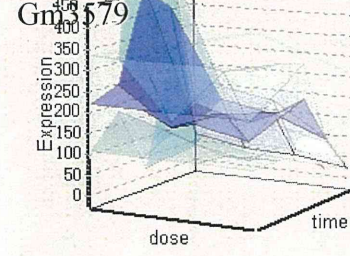
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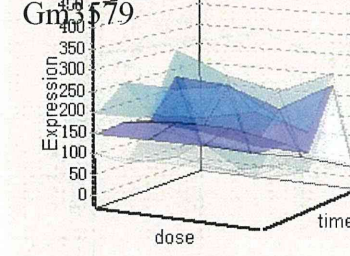
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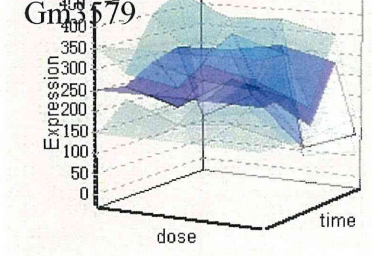
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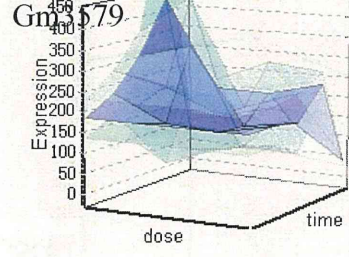
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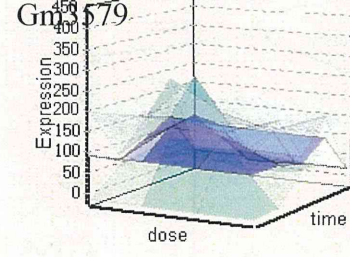
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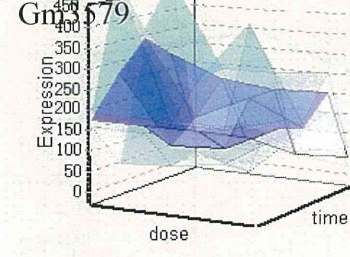
MLG802 TTG157-L



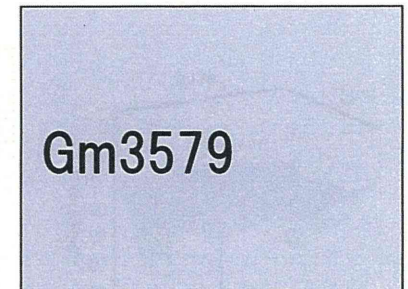
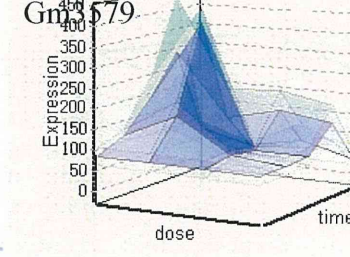
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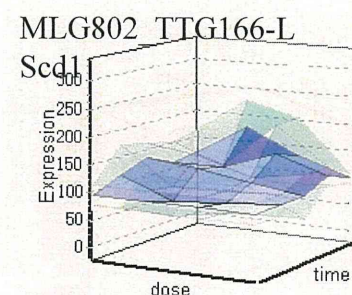
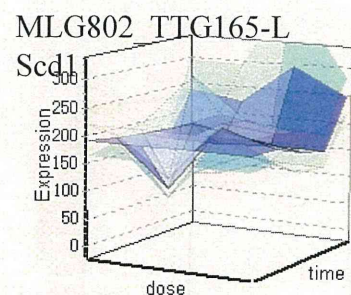
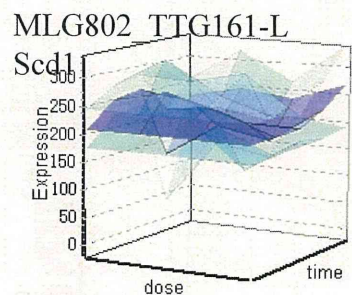
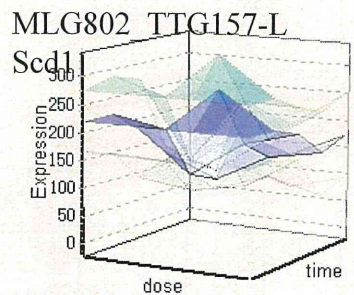
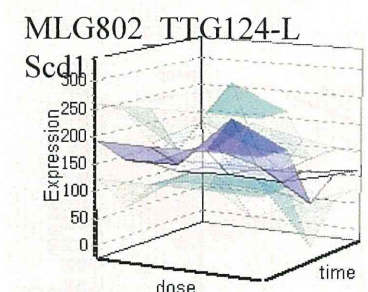
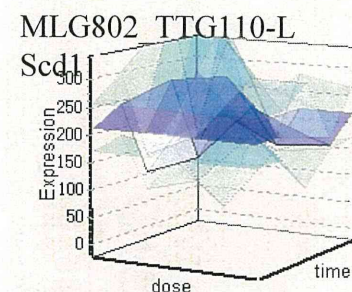
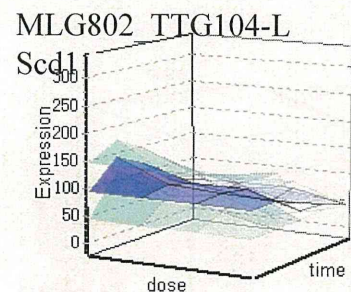
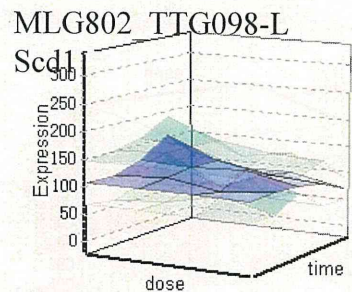
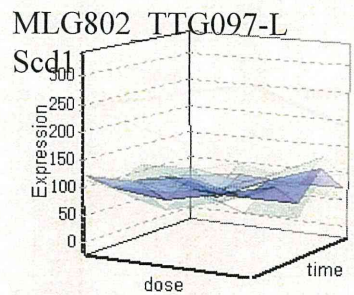
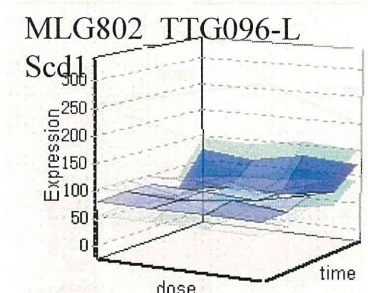
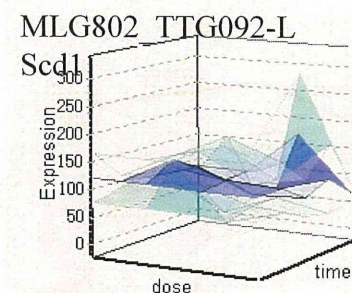
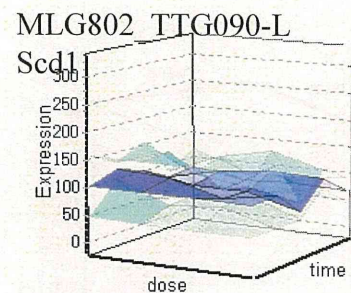
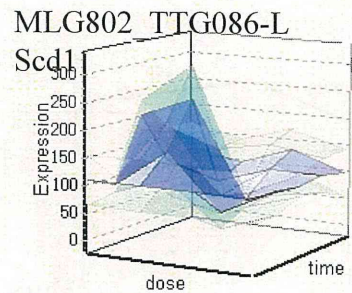
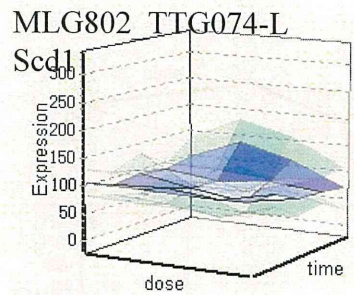
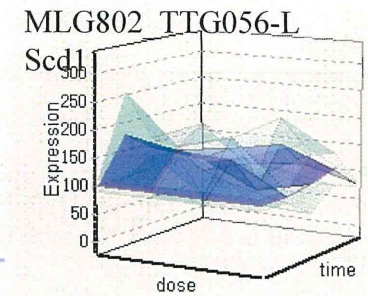
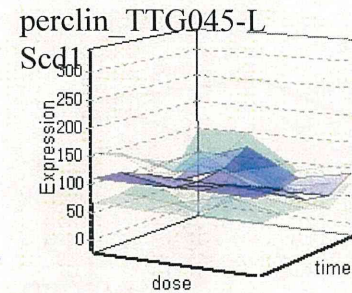
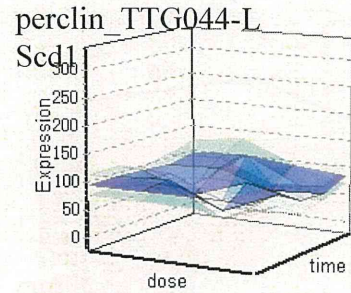
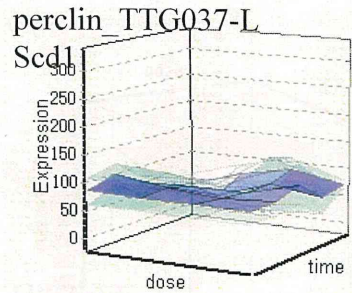
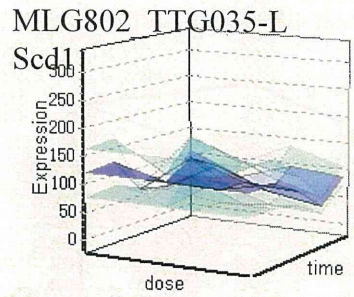


MLG802 TTG165-L

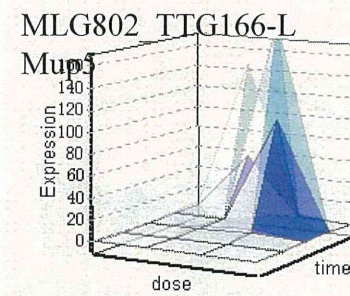
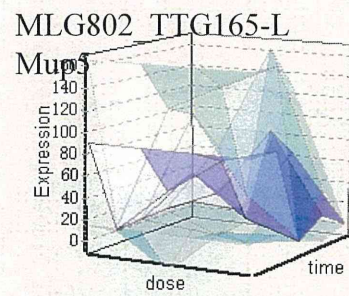
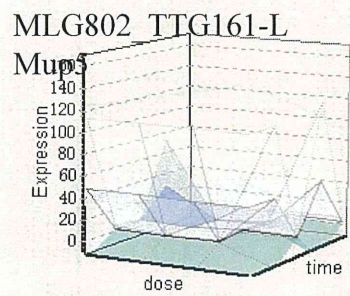
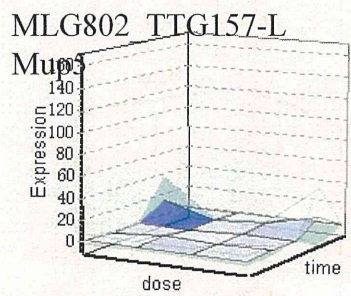
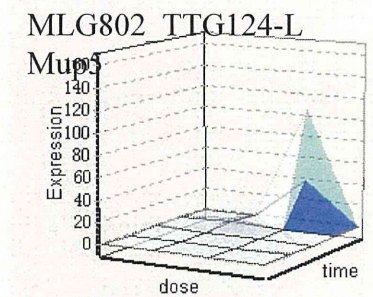
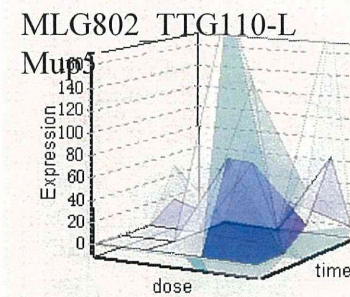
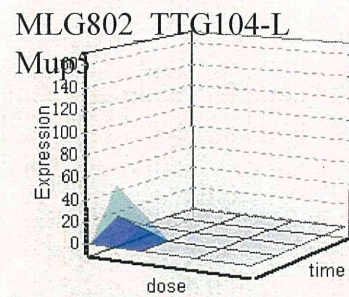
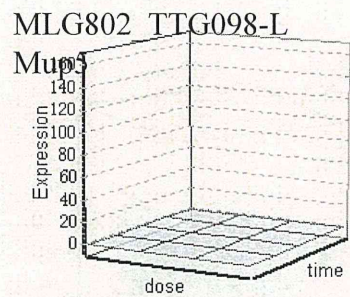
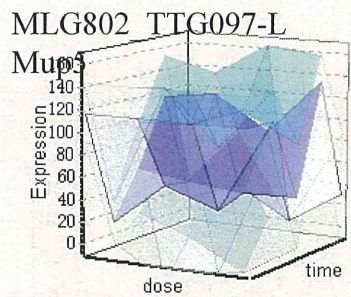
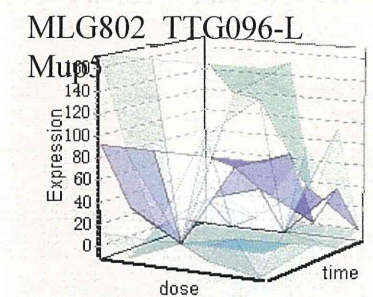
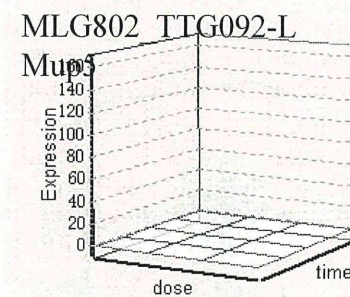
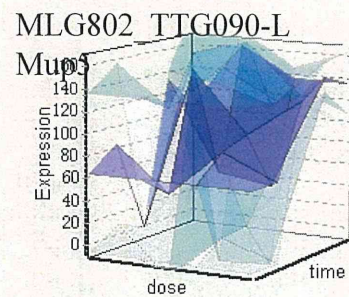
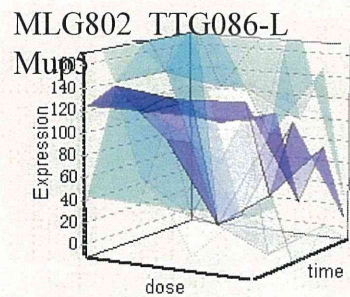
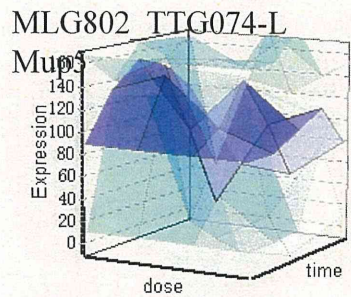
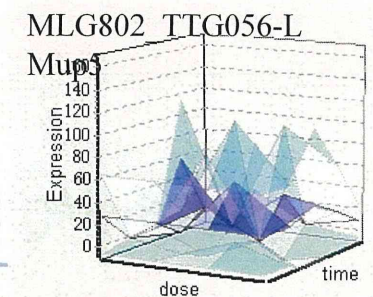
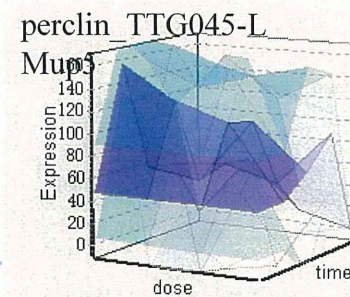
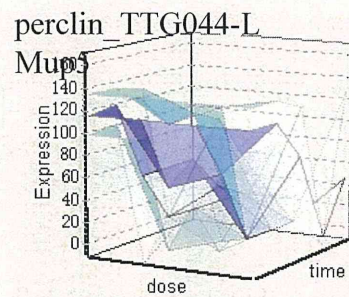
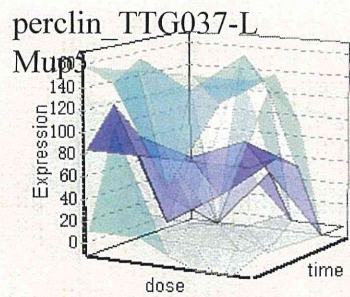
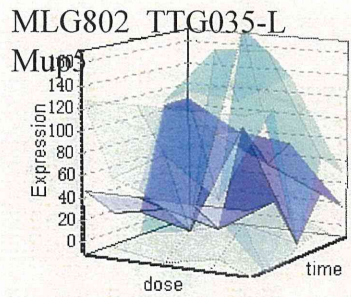


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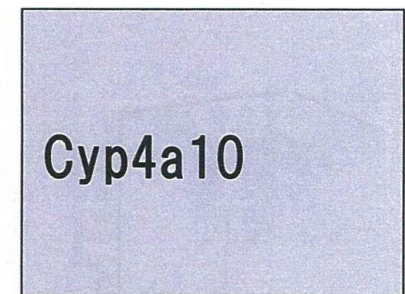
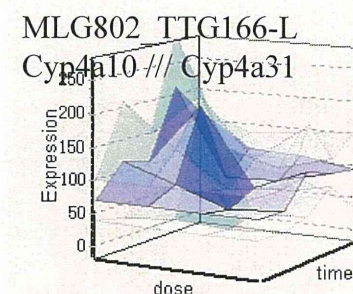
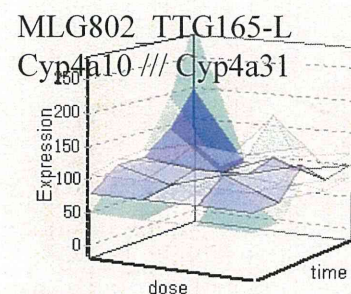
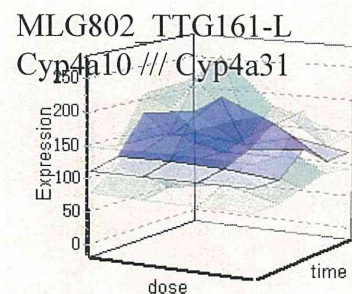
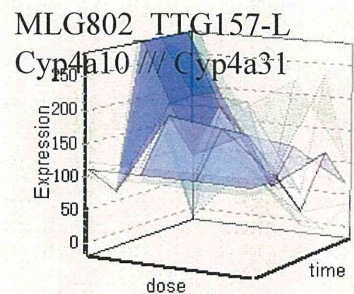
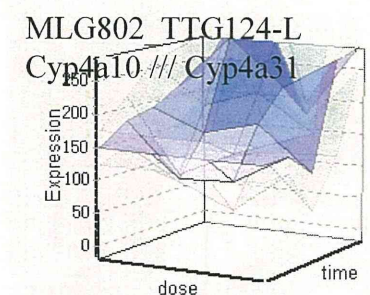
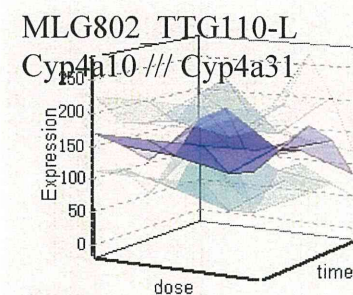
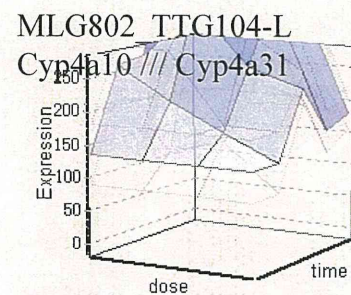
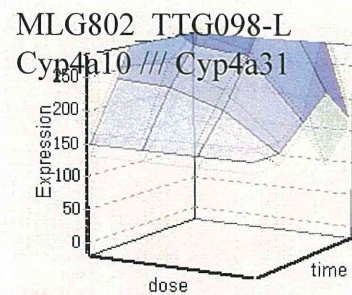
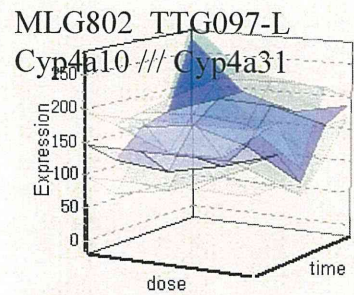
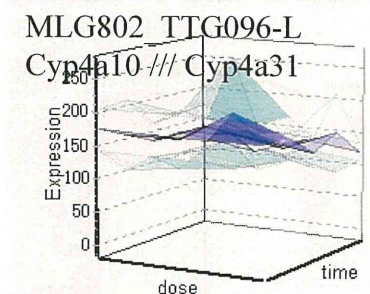
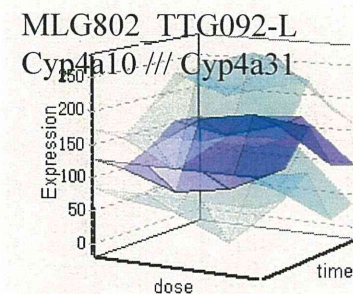
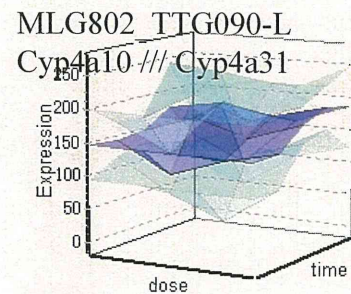
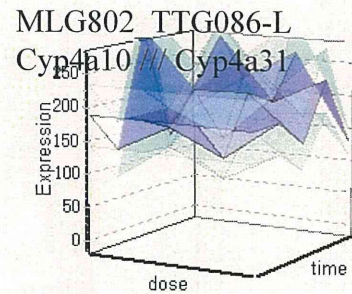
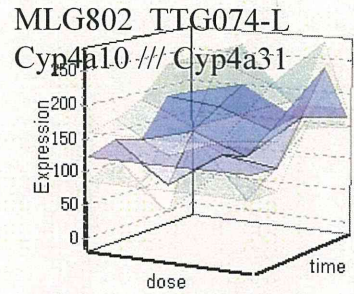
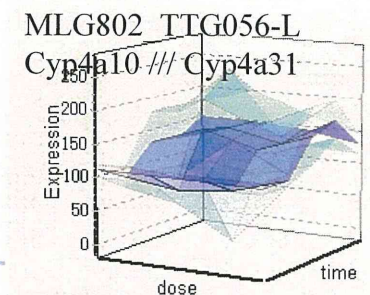
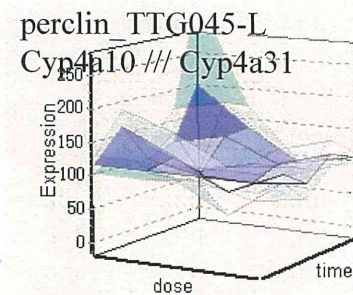
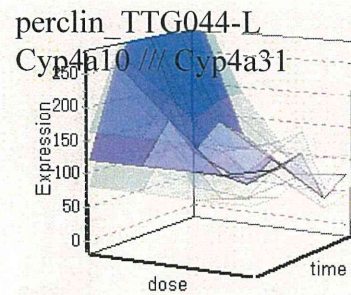
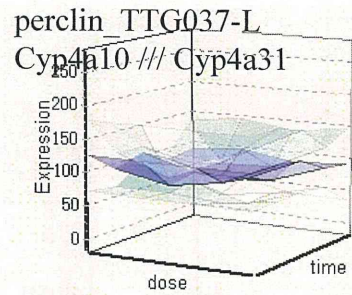
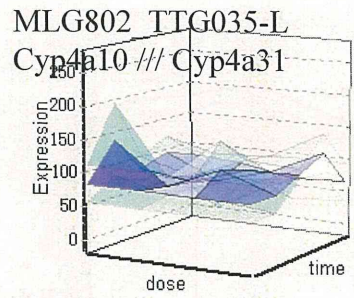


Scd1
ステアロイル-
CoA不飽和化
酵素1

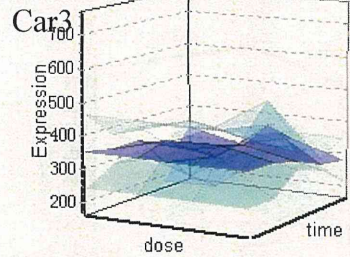


Mup5
Major urinary protein 5

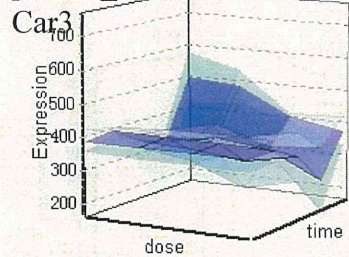
-165-



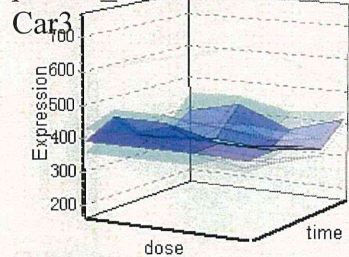
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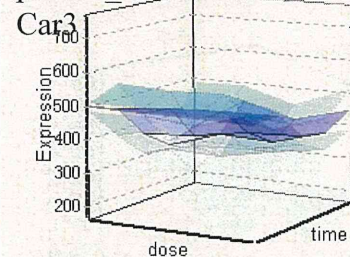
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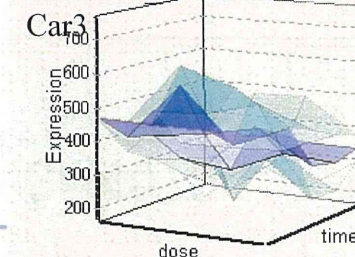
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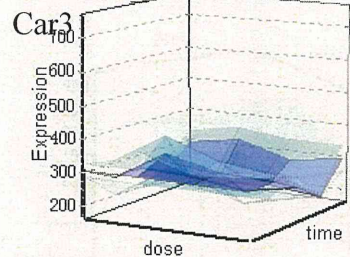
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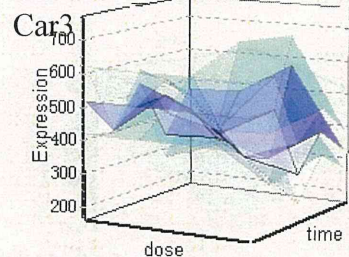
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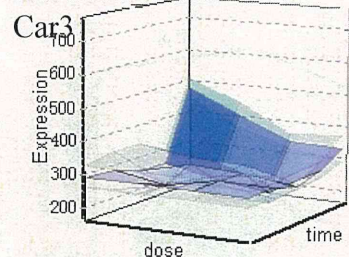
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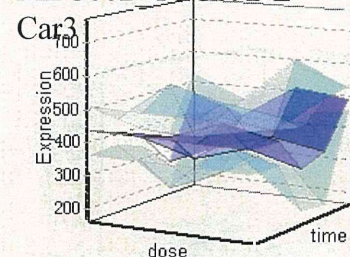
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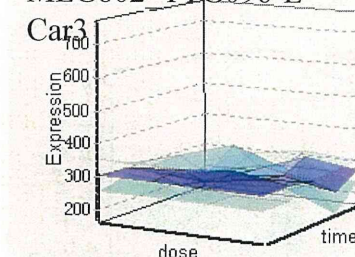
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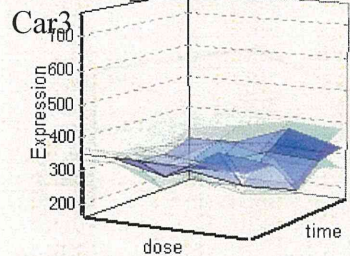
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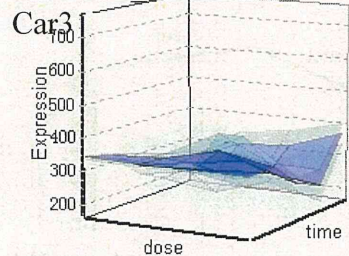
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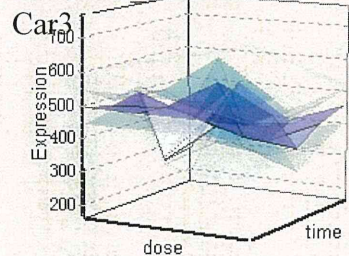
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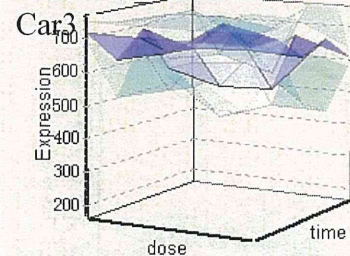
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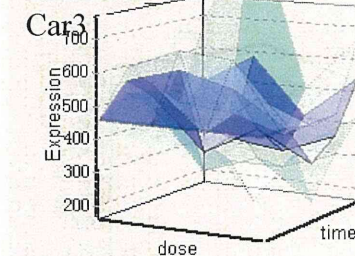
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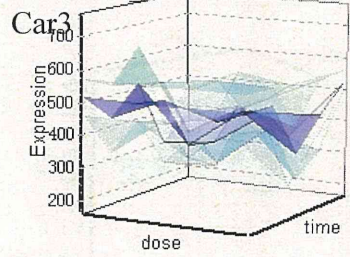
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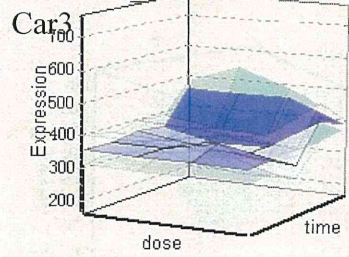
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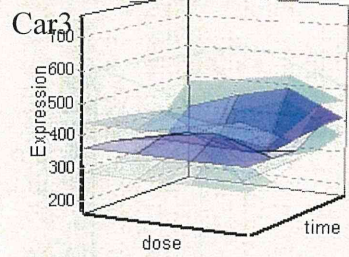
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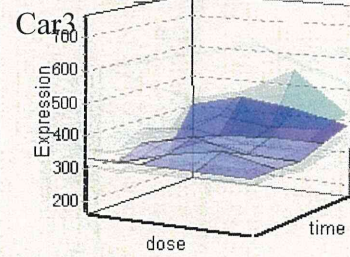
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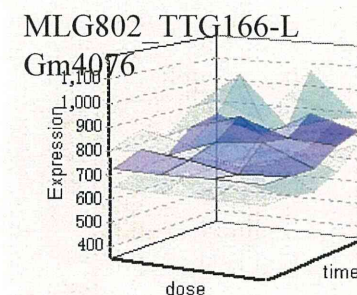
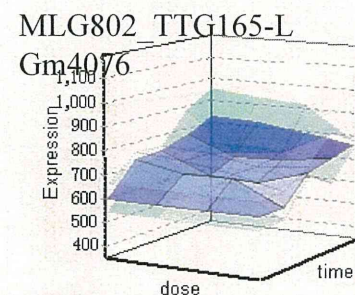
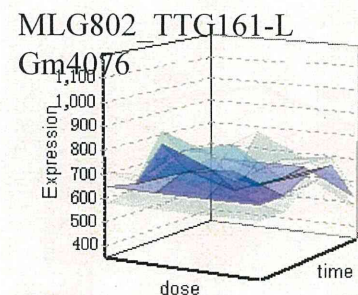
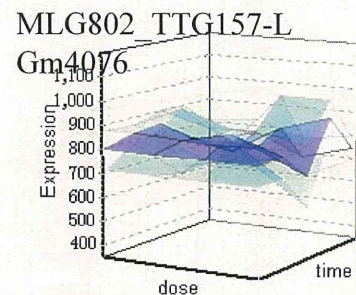
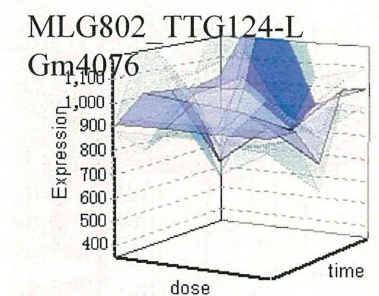
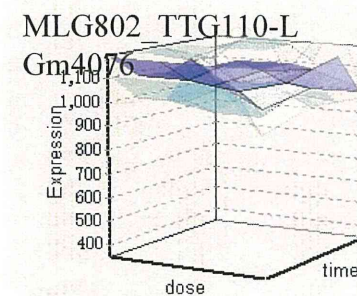
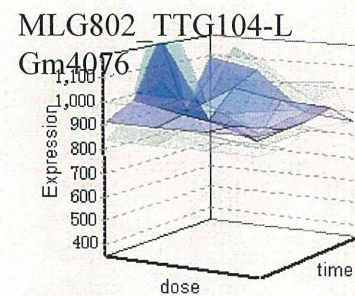
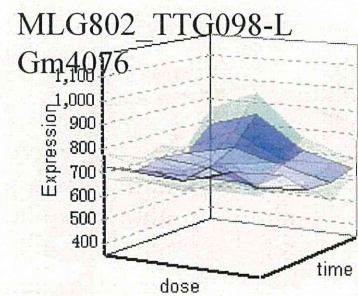
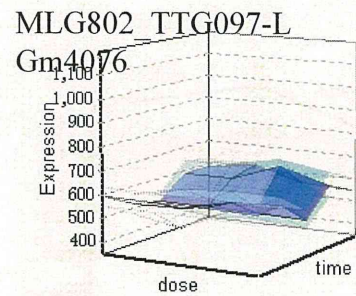
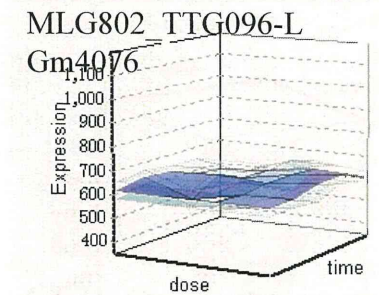
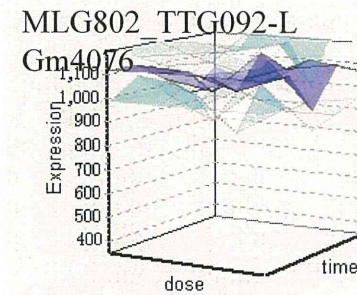
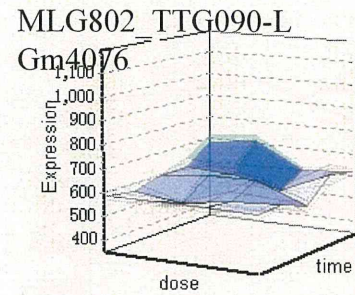
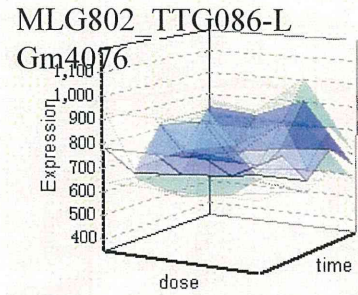
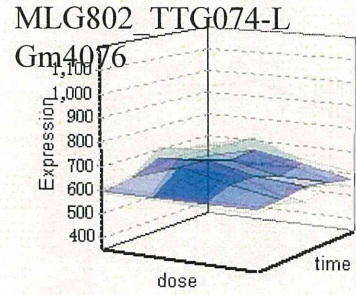
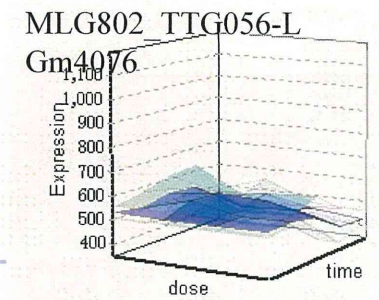
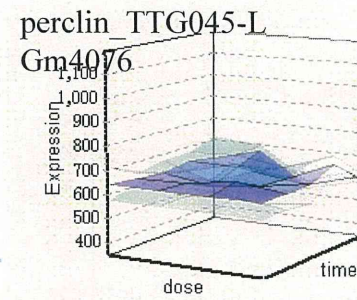
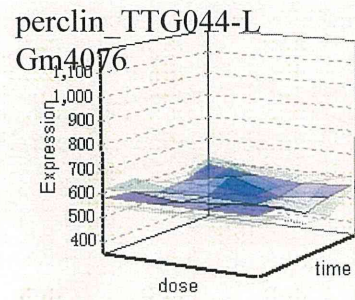
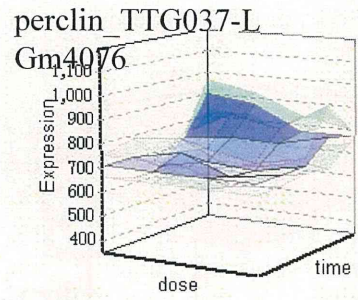
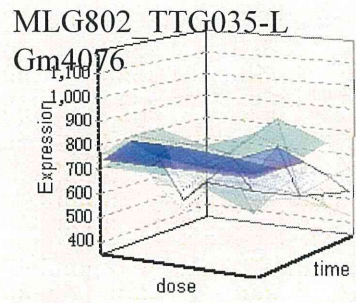
MLG802 TTG165-L



MLG802 TTG166-L

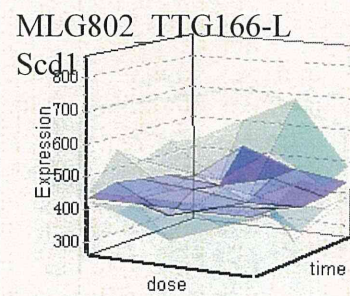
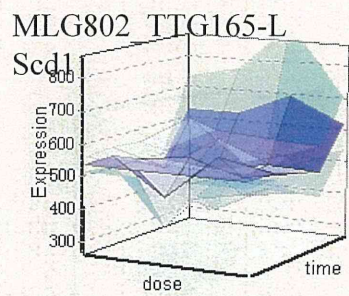
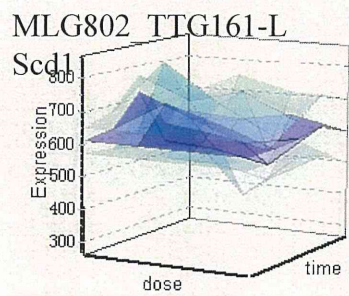
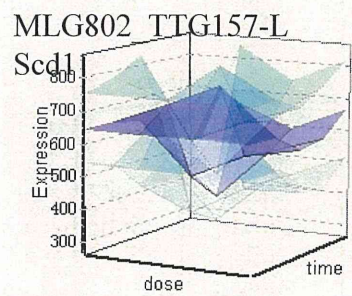
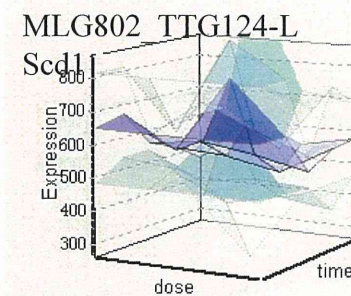
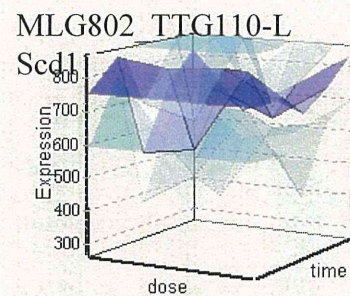
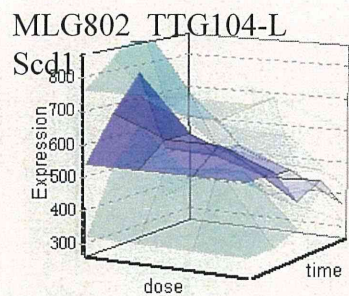
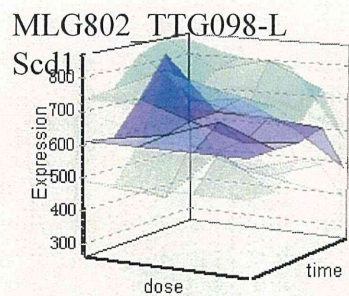
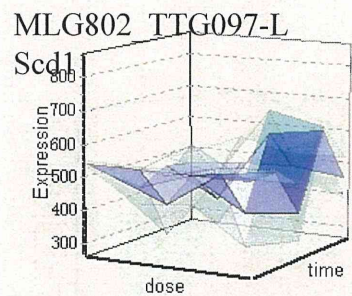
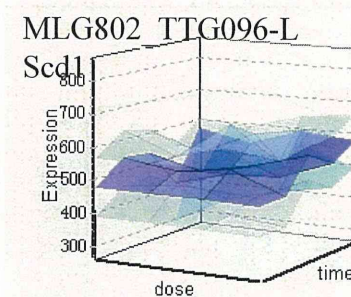
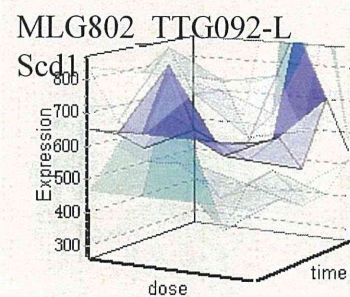
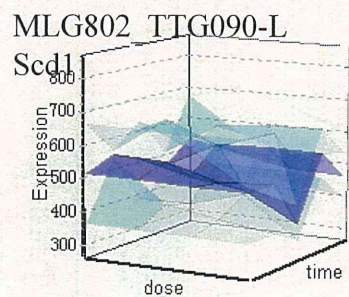
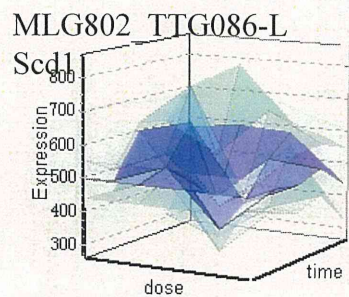
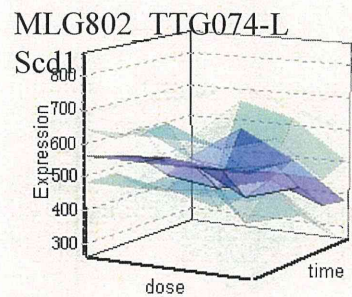
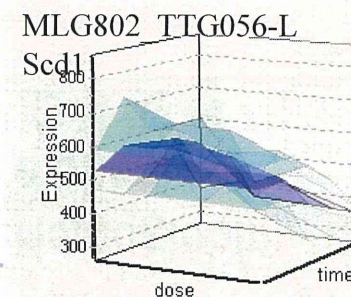
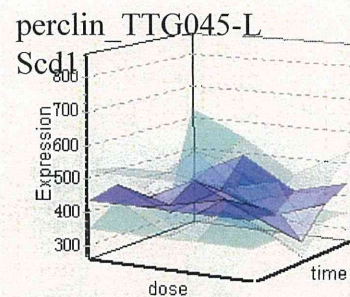
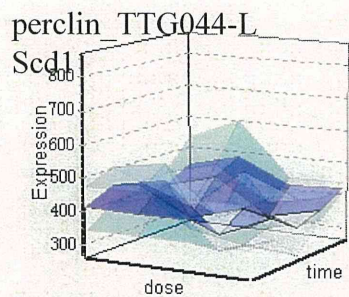
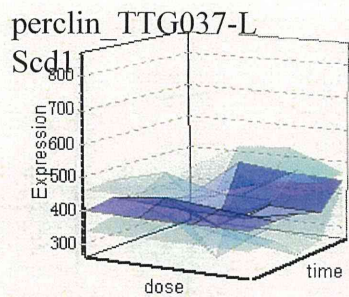
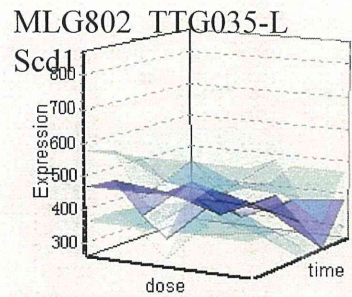


Car3
脱炭酸酵素



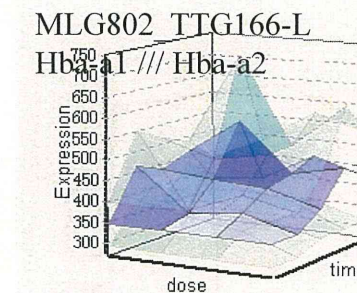
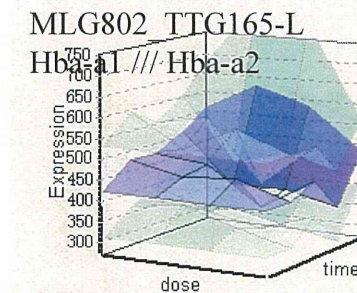
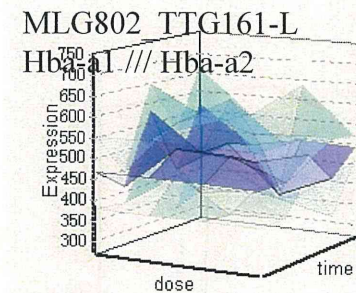
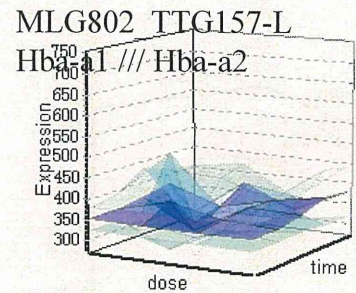
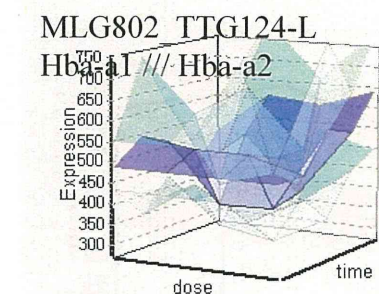
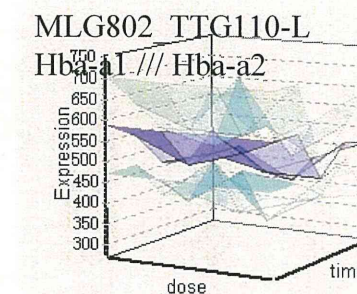
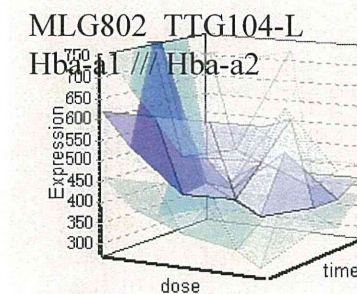
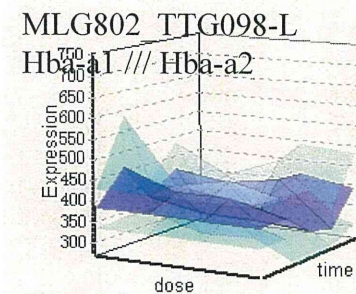
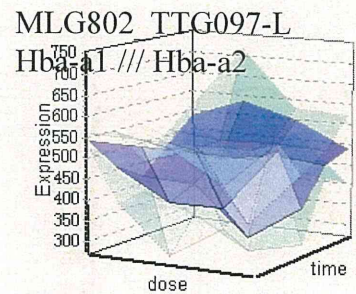
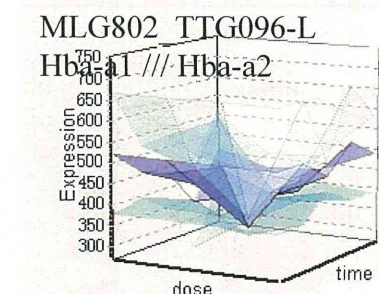
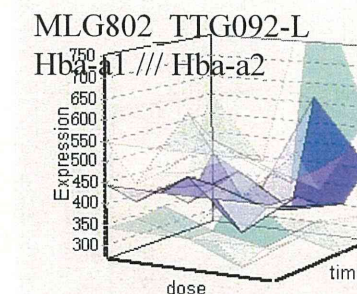
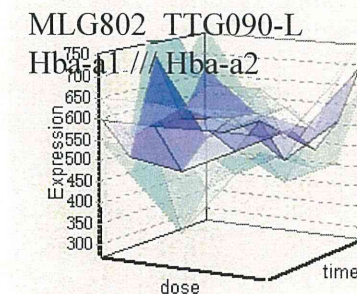
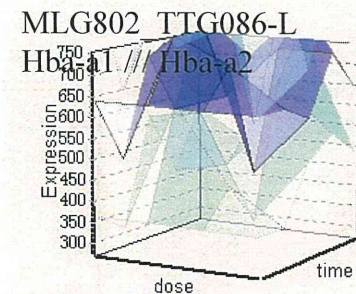
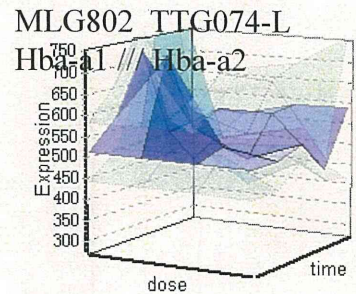
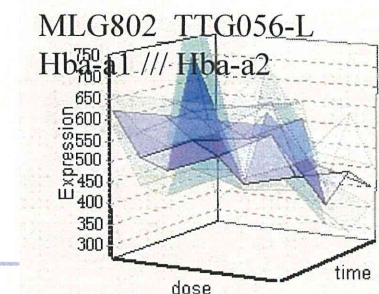
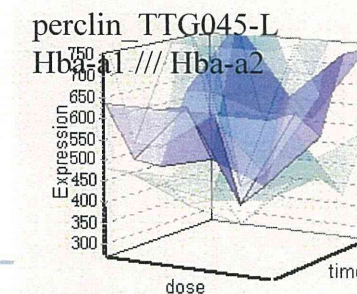
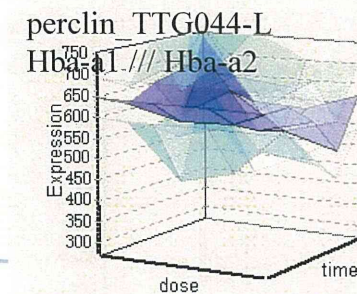
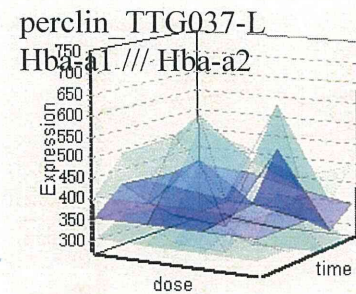
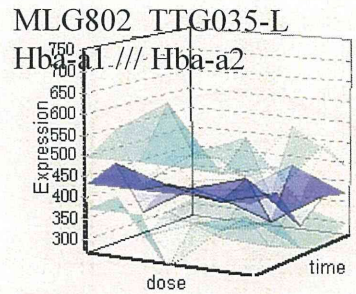
Gm4076

-168-



Scd1
ステアロイル-CoA不飽和化
酵素1

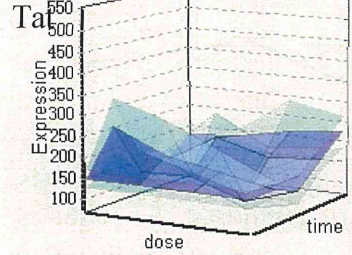
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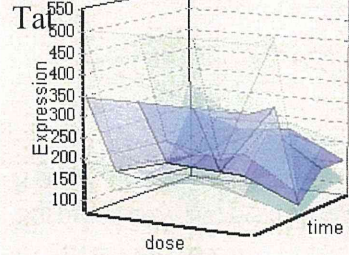
Hba-a1
Hemoglobin
alpha 1
血液関連

-170-

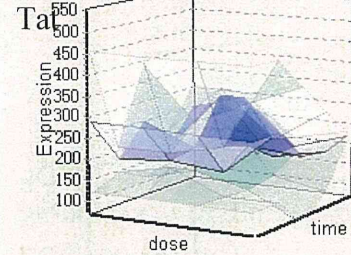
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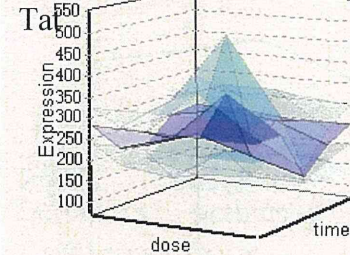
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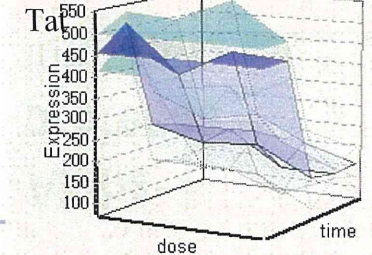
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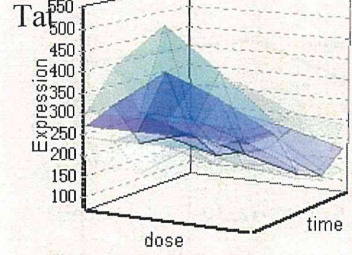
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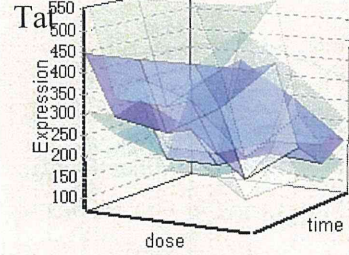
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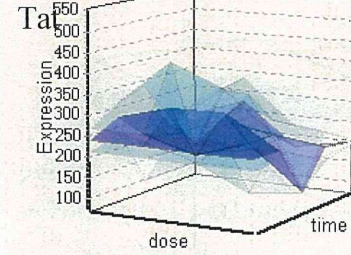
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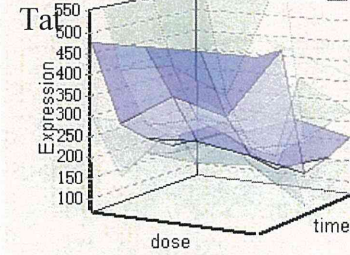
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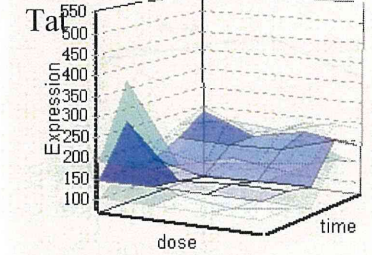
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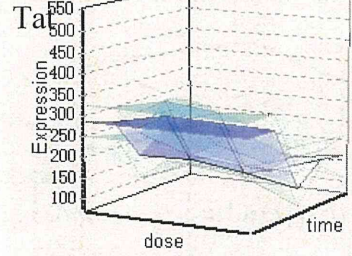
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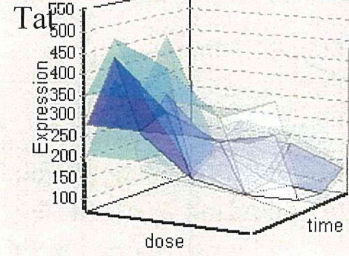
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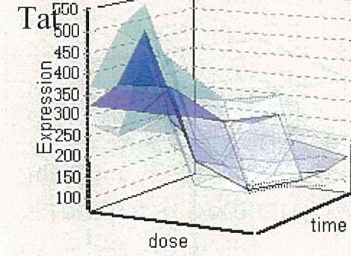
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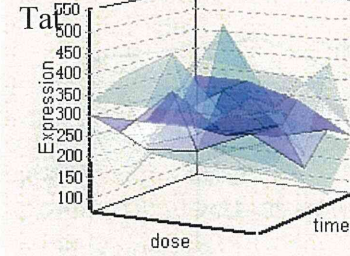
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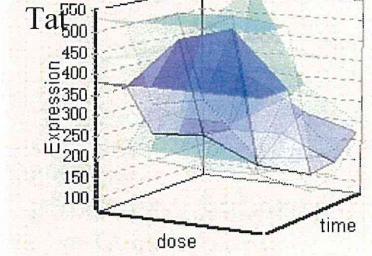
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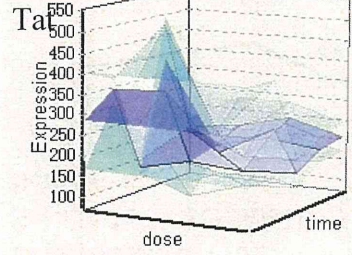
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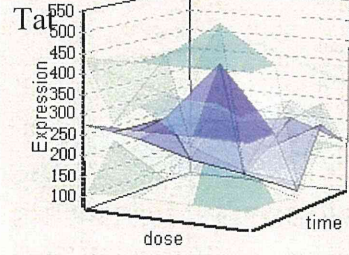
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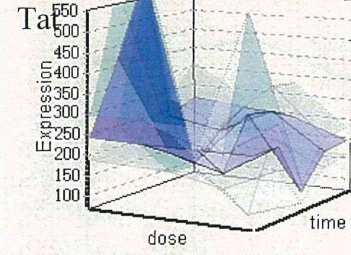
MLG802 TTG157-L



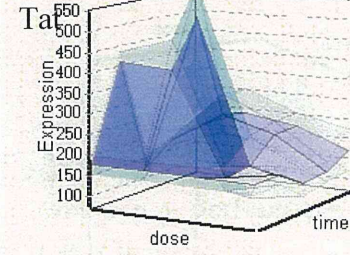
MLG802 TTG161-L



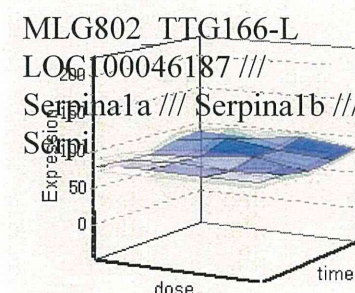
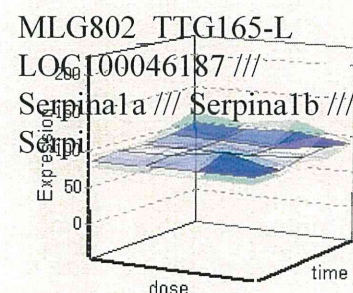
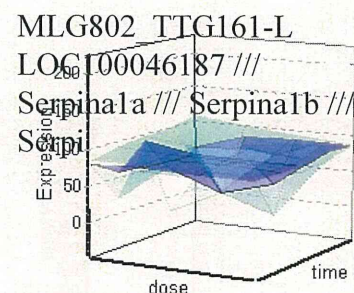
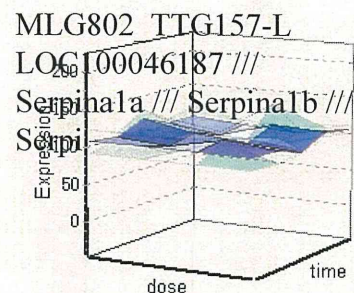
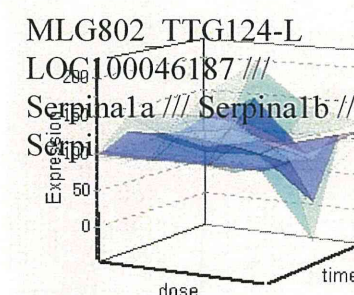
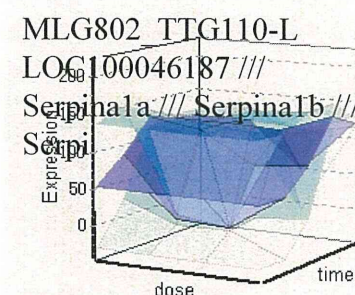
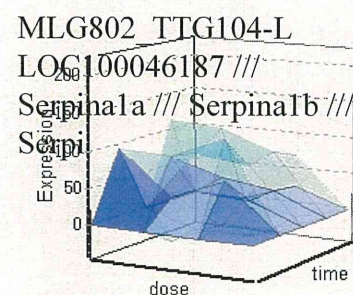
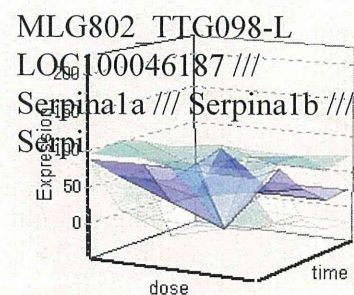
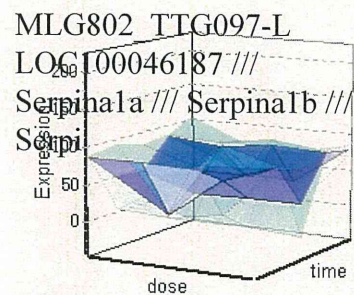
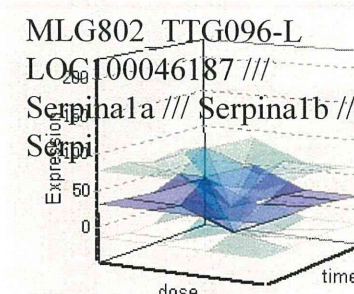
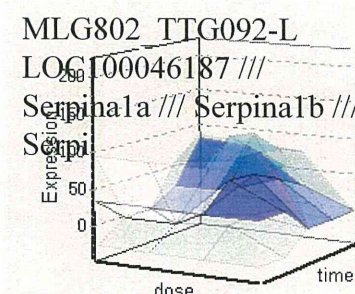
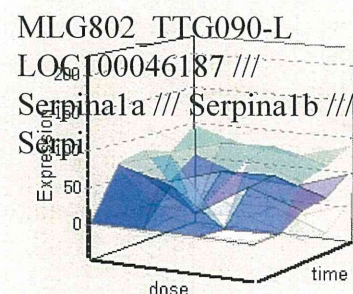
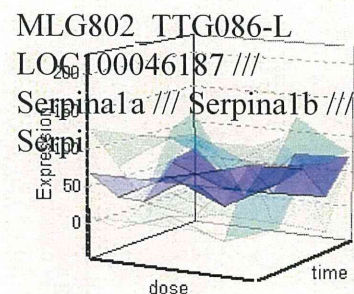
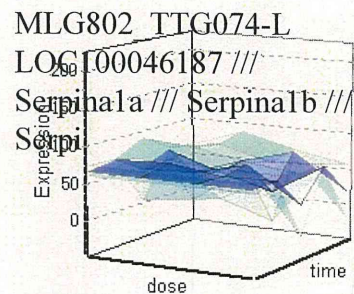
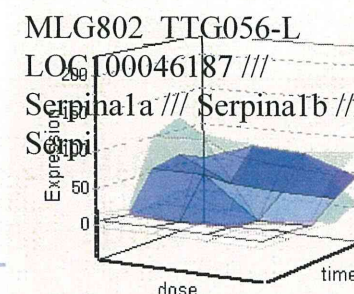
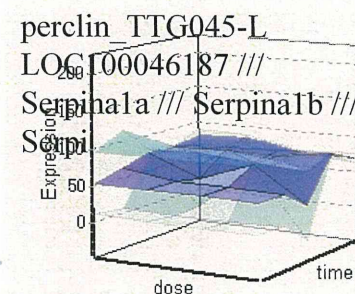
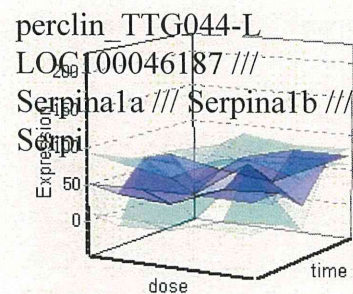
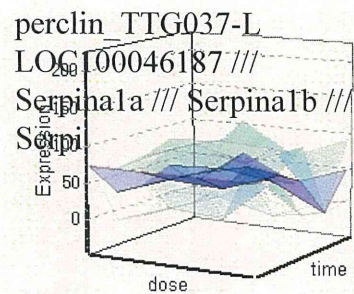
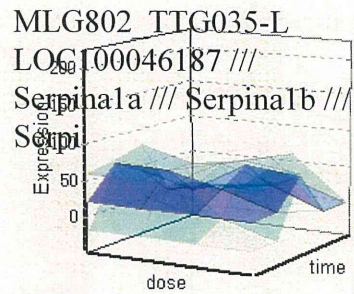
MLG802 TTG165-L



MLG802 TTG166-L

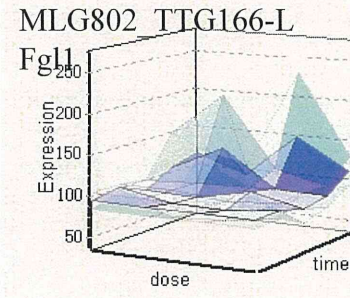
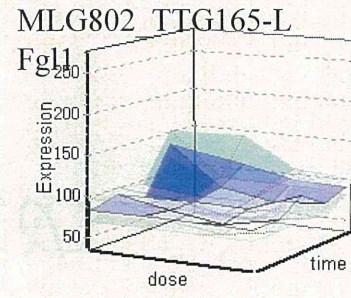
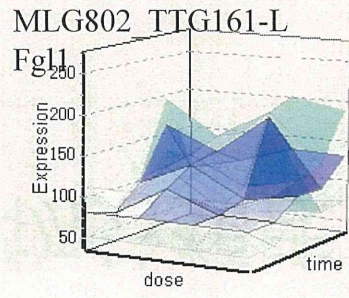
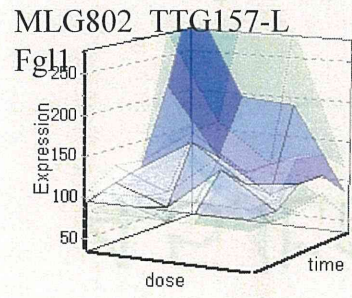
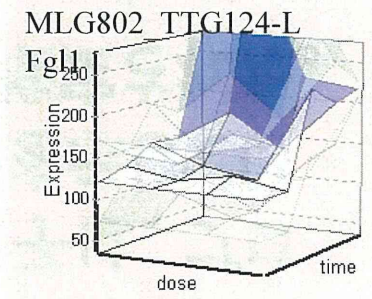
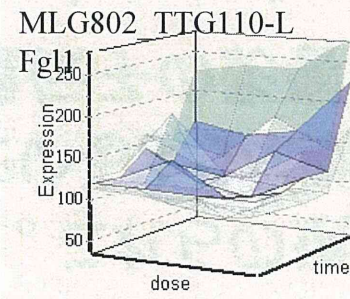
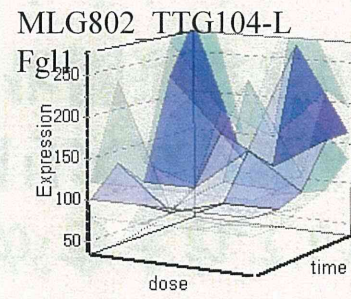
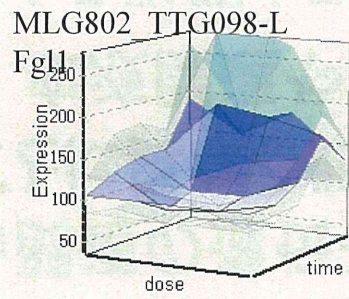
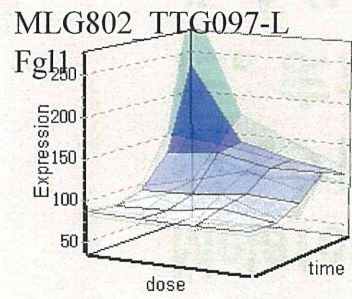
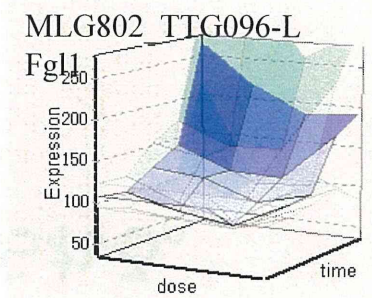
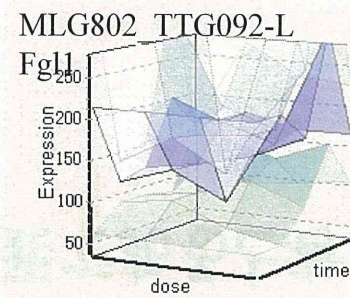
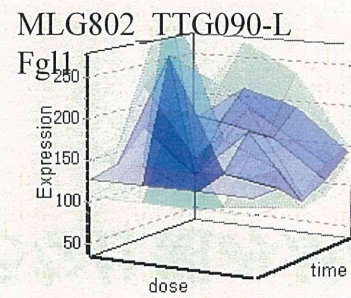
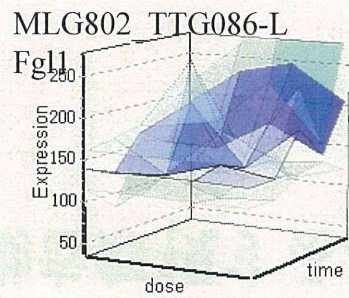
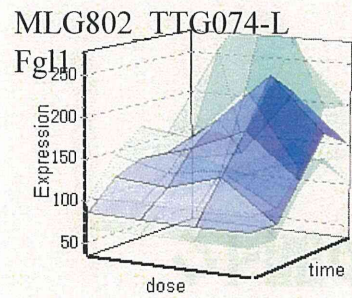
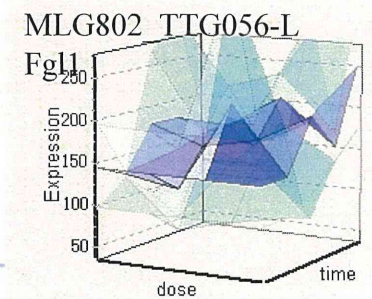
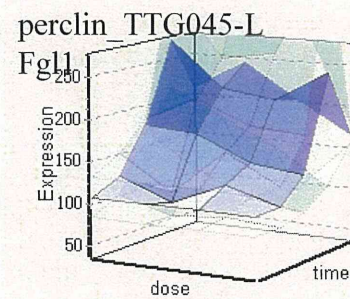
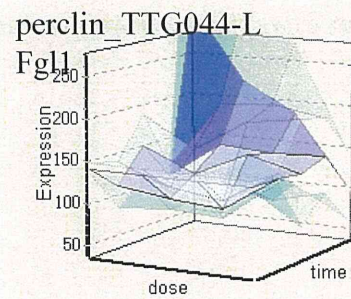
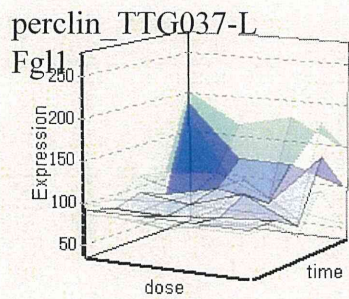
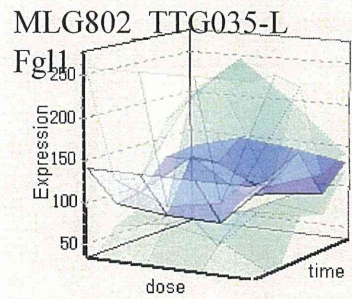


Tat
Tyrosine
aminotransfer
ase



Serpina1a
Alpha-1
protease
inhibitor

-172-



Fgl1
Fibrinogen-like
protein 1
血液

4.5.化合物分類まとめ

- ・ プロジェクト間の隔たりを生み出す遺伝子として、Mt1やMt2などのMelatonin関連の遺伝子が含まれていた。これらの遺伝子は、プロジェクトごとに異なる概日リズムを刻んでいるような動きを示していた。また、血液関連や消化関連などの遺伝子の影響も推定された。
- ・ 化合物による影響を取り出すためには、これらの遺伝子のプロジェクト間の動き無視するような仕組みが必要であると考えられる。

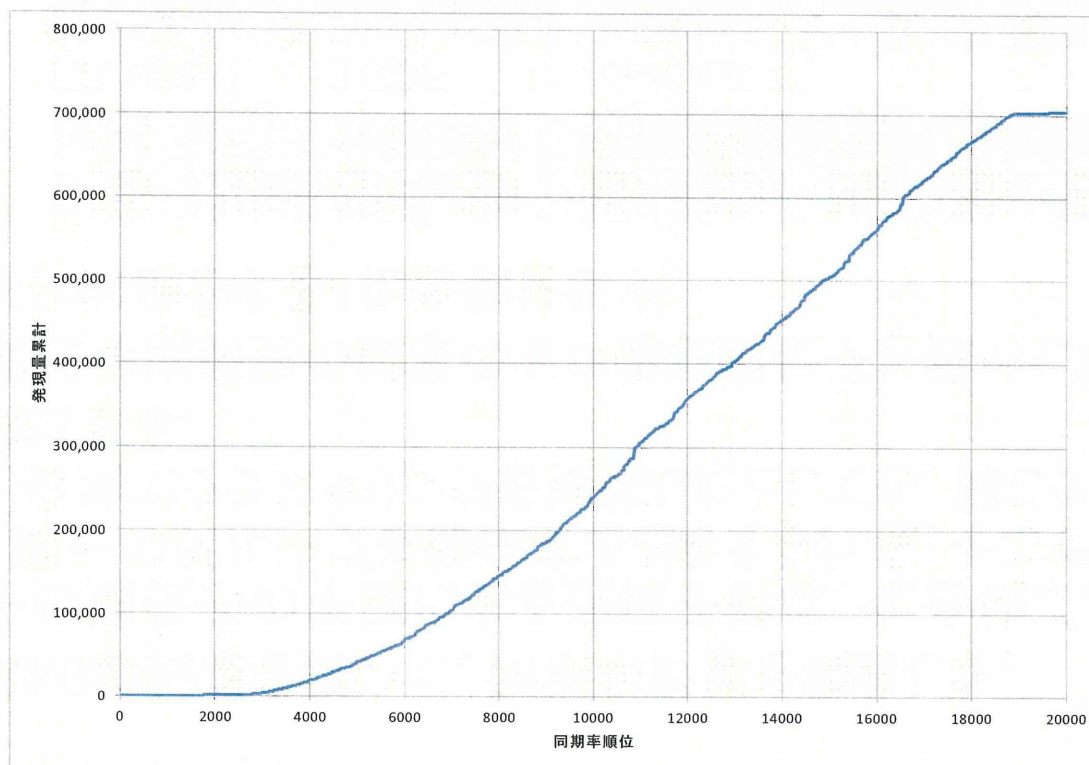
5.同期率計算

- ・ MLANGの結果を用いて、同期率計算を実施した。
- ・ 同一の遺伝子の下流にある遺伝子群は、化合物ごとに応答パターンは異なるが、同一のグループを形成すると考えられる。そこで同期率計算によって、異なる化合物でクラスタリングを実施したとしても、同じクラスタに分類される遺伝子を抽出する。
- ・ 平成22年度研究の成果のゼロ発現遺伝子を除外し同期率計算を実施した。
- ・ 以下に対象とする4化合物を示す

Project Name	化合物	Vehicle
TTG020-L	TCDD	corn oil
TTG026-L	TCDF	corn oil
TTG047-L	Bisphenol A	DMSO 0.1% + MC 0.5%
TTG048-L	Genistein	DMSO 0.1% + MC 0.5%

5.1.同期率計算結果

同期率の高い順に、発現量を累積したグラフを示す。



最上位は、発現量が0に近く、ゼロ発現と思われる。ゼロ発現識別は、計算速度向上のためであり、本来の目的は達した。しかし、識別できなかった遺伝子が残っていたと考えられる。

5.2.1.同期率計算結果

- ・ 各プロジェクトで平均発現量が5コピー以上である遺伝子の同期率上位20位までの反応サーフェスを、TTG20とTTG26で示す。
- ・ 一見して、4パターンに分類可能であり、赤枠、青枠、緑枠、枠なしで示す。TTG20とTTG26で同様の分類となっていた