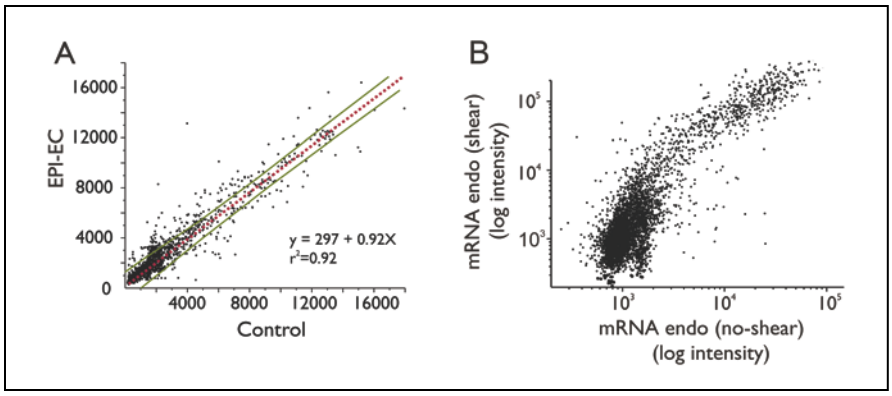

Figure S1. Distribution of genes within the cell types used and overall effect of shear stress. (**A**) Note that when comparing primary epileptic endothelial cells and control, several genes were outside of the confidence interval (green lines, 95%). Among these were CYP enzymes, but several other gene families were also regulated differently in epileptic endothelial cells. (**B**) Gene expression in cells grown under static (no-shear) or dynamic (DIV, 1 week, 3 dynes/cm^2) conditions are compared by plotting the log of intensity values for each individual cDNA present in the filter.

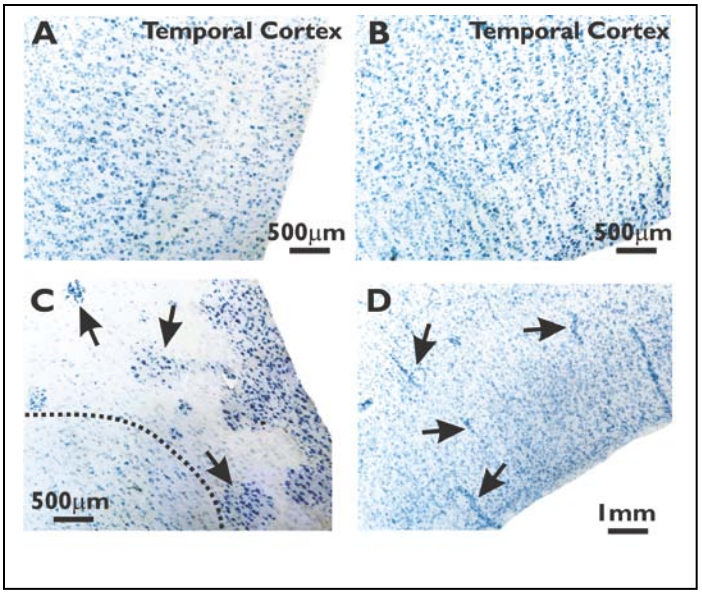

Figure S2. CYP3A4 brain expression is associated with vascular abnormalities and neuronal heterotopias. (**C–D**) Cresyl violet staining revealed the presence of ectopic neurons and dysplastic vessels in drug-resistant epileptic tissue. (**A–B**) Note also the presence of relatively normal cortex within the samples analyzed.

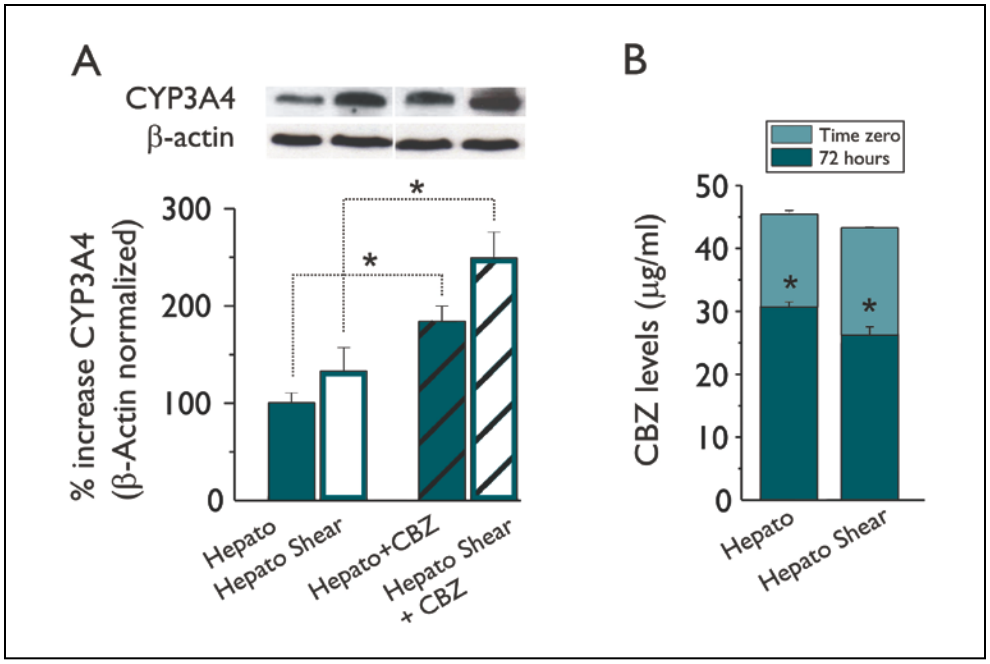

Figure S3. Exposure to CBZ but not to shear stress significantly induced CYP3A4 protein in human hepatocytes. (**A**) Although shear stress positively regulated the levels of CYP transcripts and proteins in endothelial cells (Figs. 2 and 3), the effects on hepatocyte was modest and not significant. However, CBZ induced CYP3A4 expression (one-way ANOVA, *$p < 0.05$ hepato vs. hepato + CBZ and hepato-shear vs. hepato-shear + CBZ). (**B**) Exposure to shear stress led to a modest change in the amount of CBZ metabolized by hepatocytes after 72 h (one-way ANOVA, *$p < 0.05$ time zero vs. 72 h).

Table S1. Summary of the tissue donors used.

Table S2. Complete list of the genes analyzed (GenBank/Uni-Gene IDs).

Supplemental Table 1. *Summary of the tissue donors used*

Subjects	Age (yr)	Sex	Classification	Etiology	Previous medication	Related conditions
Epi 1[a]	43	F	Right mesial temporal lobe epilepsy	Mesial temporal sclerosis	TPM,PHT	Depression
Epi 2[a]	37	M	Left mesial temporal lobe epilepsy	Mesial temporal sclerosis	PHT, PB, VPA	Psychiatric disorder
Epi 3[a]	53	F	Right parietotemporal lobe epilepsy	Vascular malformation	PHT, VPA, PB,PRM,FBM, GBP,TPM,CBZ, DMX	Port-wine stain
Epi 4[a]	39	M	Right mesial temporal lobe epilepsy	Mesial temporal sclerosis	TPM, PHT	Childhood febrile seizure
Epi 5[b]	30	F	Left temporal lobe epilepsy	Left hippocampal atrophy	CBZ, PB,PRM	Childhood febrile seizure
Epi 6[b]	5	F	Right hemispheric epilepsy	Remote symptomatic, hemiconvulsive hemiplegia epilepsy	GBP,OXC,PBT, PHT, VPA,ZNS;	Severe hemiparesis (left) Hemianopsia (left) Developmental delay
Epi 7[b]	39	M	Focal epilepsy	Unknown	CBZ,DZ,GBP, LEV, PHT, PRM, TPM, VPA, ZNS	none
Epi 8[b]	1	F	Hemispheric Epilepsy	Malformation of cortical development (right hemisphere)	TPM	Hemiparesis (left), developmental delay, severe hypotonia

Subjects	Age (yr)	Sex	Classification	Rankin grading scale	Previous medication	Related conditions
Ane 190[a]	41	M	Middle cerebral artery aneurysm	I	Unknown	Alcoholism
Ane 191[a]	59	M	Anterior communicating aneurysm	II	Propranolol	Hypertension
Ane 200[a]	77	F	Left distal branch of middle cerebral aneurysm	I	Doxepin	Hypertension
Ane 201[a]	51	F	Middle cerebral artery aneurysm, acute hemorrhage	I	Unknown	Unknown

TPM, Topamax, Topiramate; PHT, Phenytoin, Dilantin; PBT, Phenobarbital; PRM, Primidone; FBM, Felbamate; GBP, Gabapentin, Neurontin; DZ, Diazepam; CBZ, Carbamazepine, Tegretol; DMX, Diamox, VPA, Valproic acid, Valproate, Depakene; LEV,Levetiracetam, Keppra; ZNS, Zonisamide, Zonegran; LZP, Lorazepam, Ativan; LTG, Lamotrigine, Lamictal; OXC, Oxcarbamazepine; TLE, Temporal Lobe Epilepsy.

[a] Gene filter analysis, *in vitro experiments*, [b] Immunocytochemistry