Biological explanation for Schizophrenia

Genetic factors:
Gottesmen found Schizophrenia is proportional to the amount of genes they share.
Mz twins-48%, children with two affected parents-46%, DZ twins or one affected parent-17%, Grandchildren-5%, general population-1%.
Gottesman summarised 40 studies differences in severity of symptoms of schizophrena. Concordance rate- 48%.MZ twins. 17% DZ twins suggest biological factors are important. Also reported concordance rate for twins who grew up apart had the same CR for identical twins suggesting it’s not due to their childhood.
Torrey—many twin studies inadequate. Reviewed 8 studies, representative samples used, allocation of twin pairs to identical/fraternal was done with reasonable certainty. CR MZ twins 28% compared with only 6% for fraternal DZ twins. Much lower than Gottesman in line with Joseph MZ twins, considered 9 most recent twin studies on schizophrenia finding a concordance rate of 22.4% for identical twins and 4.6% for fraternal twins. Much lower figures have to take into account the fact that the lifetime risk of general population is 1%, more of a chance if you have a twin with the condition.
Cardno et al based on Maudsley twin register which used strict diagnostic criteria, CR of 26.5% for MZ twins and 0 for DZ twins. Shows strong genetic factor.
Kety found high rates of schizophrenia in individuals whose biological parents had the disorder but adopted by psychological healthy parents.
Tienari in Finnish adoption study, identified 155 adopted children whose biological mothers had been diagnosed with schizophrenia. Compared them with a matched group of adopted children-no family history of schizophrenia. Found 10% of the adopted group—mothers had schizophrenia, compared to 1% of the second group. Shows strong evidence for a genetic component.
100% identical the risk factor is well below 100%-other factors included.

AO2:
MZ twins rare in the population, only 1% to have Schizophrenia sample sizes small. Don’t use same diagnostic criteria comparisons can’t always be made different definitions produce different CR rates. Advances in technology easier to assess zygosity accurately, in many of the studies different criteria used to distinguish between DZ and MZ twins. CR rates can be calculated in different ways and vary widely depending on the method used.

IDA: Reductionist, Deterministic,

Biochemistry:
Genetic factors operate through brain mechanisms either brain chemistry/neuronatomy – provide vehicles for genetic transmission.
Millions of neurotransmitters-chemical transmitters. Dopamine most promising in Schizophrenia. Excess of dopamine results in Schizophrenia at certain synaptic sites. Caused by either release of excess dopamine by presynaptic neurons, excess of dopamine receptors or over-sensitivity of dopamine receptors.
Phenothiazines—block dopamine at the synapse, alleviates major symptoms of Schizophrenia.
Clozapine—most effective, PET scans show it occupies dopamine receptor sites to the same extent as other neuroleptic drugs.
L-dopa—increases dopamine levels. Can produce symptoms of Schizophrenia in unaffected individuals.
Amphetamines—increases availability of Dopamine and Noradrenaline can induce symptoms of acute paranoid Schizophrenia in previously unaffected individuals and increase the severity of symptoms in previously diagnosed cases of Schizophrenia. Post mortem if people with Schizophrenia show increase of dopamine in parts of the brain. Seeman reviewed a number of studies which found increases in dopamine receptor density of 60-110% compared to controls.
PET scans—investigation of live brains, Wong et al found a two-fold increase in the density of dopamine receptor sites in schizophrenic patients—never treated with drugs compared with patients who had been treated with drugs and to a control group. Laurelle et al-administered amphetamine to those with Schizophrenia and those without. Patients with Schizophrenia showed a greater increase in dopamine transmission in response to the amphetamine than the individuals who didn’t have Schizophrenia. Winterer and Weinberger discussed research focusing on dopamine receptor types D1 and D2, both which assist in producing stable representations of external/internal stimuli. Schizophrenics often have an abnormal dopamine D1:D2 ratio, causes disruption leads to symptoms of Schizophrenia.

AO2:
Cause and effect with dopamine levels and Schizophrenia.