Genotyping by PCR
Clinical Laboratory Report

ACUMEN DIAGNOSTICS PTE LTD.
Tel: 8339 8766 HCI: 20I0257
41 Science Park Road #01-02
Singapore 117610

Patient Name	MOCK
NRIC/FIN No.	XXXXX999A
Passport No.	
Nationality	SINGAPOREAN
D.O.B.	01-JAN-1999
Sex (M/F)	M

Accession No.	MOCK	**Clinic / Hospital**	MOCK
Lab-Use ID	MOCK	**Ordering Doctor**	MOCK
Date of Sampling	DD-MMM-YYYY	**Date of Receipt**	DD-MMM-YYYY hh:mm:ss
Sample Type	Whole blood in EDTA tube	**Date of Results**	DD-MMM-YYYY hh:mm:ss

Genotyping by PCR - Drug Pharmacogenomics Test

Gene Test	Diplotype Detected*	Test Result
CYP2C19	*1/*1	Normal metaboliser (Normal enzyme function) *See Page 2 for Medication Insights and CPIC® Therapeutic Recommendations*

**Allelic variants tested for CYP2C19:*
*2 (c.681G>A, rs4244285), *3 (c.636G>A, rs4986893), *17 (c.-806C>T, rs12248560).

Disclaimers:
This genotying test is a clinical test intended to provide genetic information to the healthcare provider to aid in the dose selection of drugs. CYP2C19 genetic variations detected under this test do not account for all of the variability in drug pharmacokinetics. This test is not intended as diagnostic, nor is it capable of being an advice on any specific problem or a recommendation for the prescription of any specific drug or a replacement thereof. The healthcare provider shall exercise professional judgement and careful interpretation of the test result in determining their advise to the patient and in the dose selection of drugs.

Verified By:	MR LOUIS ONG	<Title>
Approved By:	DR CHIEW YOKE FONG	Medical Director

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Medication Insights and Therapeutic Recommendations According to the CPIC®

Test Result (As in Page 1)	**Diplotype detected:** *1/*1 Normal metaboliser (Normal enzyme function)

Therapeutic Area	**Drugs processed in part by the protein**	**Medication Insights^**	**Therapeutic Recommendations^**
Cardiology	clopidogrel	Likely typical response.	If considering clopidogrel, use at standard dose (75 mg/day) for cardiovascular and neurovascular indications.
Gastroenterology	PPIs: omeprazole pantoprazole lansoprazole esomeprazole rabeprazole dexlansoprazole	Normal PPI metabolism; may be at increased risk of therapeutic failure compared with CYP2C19 intermediate and poor metabolisers.	Initiate standard starting daily dose. Consider increasing dose by 50–100% for the treatment of H. pylori infection and erosive esophagitis. Daily dose may be given in divided doses. Monitor for efficacy.
Infectious Disease	voriconazole	Normal voriconazole metabolism.	Initiate therapy with recommended standard of care dosing.
Psychiatry	SSRIs: citalopram escitalopram sertraline	Likely typical response.	Initiate therapy with recommended starting dose.

^Medical Insights and Therapeutic Recommendation information are extracted from CPIC® guidelines.
PPIs = Proton pump inhibitors; SSRIs = Selective serotonin reuptake inhibitors.

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Genotyping by PCR - Drug Pharmacogenomics Test

Gene Test	Diplotype Detected*	Test Result
CYP2C19	*1/*2	Intermediate metaboliser (Decreased enzyme function) *See Page 2 for Medication Insights and CPIC® Therapeutic Recommendations*

**Allelic variants tested for CYP2C19:*
*2 (c.681G>A, rs4244285), *3 (c.636G>A, rs4986893), *17 (c.-806C>T, rs12248560).

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Test Result (As in Page 1)	**Diplotype detected:** *1/*2 Intermediate metaboliser (Decreased enzyme function)

Therapeutic Area	**Drugs processed in part by the protein**	**Medication Insights^**	**Therapeutic Recommendations^**
Cardiology	clopidogrel	Increased risk for adverse cardiovascular events.	Avoid standard dose (75 mg) clopidogrel if possible. Use prasugrel or ticagrelor at standard dose if no contraindication for cardiovascular indications. For neurovascular indications, consider an alternative P2Y12 inhibitor at standard dose if clinically indicated and no contraindication.
Gastroenterology	PPIs: omeprazole pantoprazole lansoprazole esomeprazole rabeprazole dexlansoprazole	Increased plasma concentration of PPI compared with CYP2C19 normal metabolisers; increased chance of efficacy and potentially toxicity.	Initiate standard starting daily dose. For chronic therapy (> 12 weeks) and efficacy achieved, consider 50%reduction in daily dose and monitor for continued efficacy.
Infectious Disease	voriconazole	Higher dose-adjusted trough concentrations of voriconazole compared with normal metabolisers.	Initiate therapy with recommended standard of care dosing.
Psychiatry	SSRIs: citalopram escitalopram sertraline	Reduced metabolism; when compared to normal metabolisers.	Initiate therapy with recommended starting dose.

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Genotyping by PCR - Drug Pharmacogenomics Test

Gene Test	Diplotype Detected*	Test Result
CYP2C19	*1/*3	Intermediate metaboliser (Decreased enzyme function) *See Page 2 for Medication Insights and CPIC® Therapeutic Recommendations*

**Allelic variants tested for CYP2C19:*
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Medication Insights and Therapeutic Recommendations According to the CPIC®

Test Result (As in Page 1)	**Diplotype detected:** *1/*3 Intermediate metaboliser (Decreased enzyme function)

Therapeutic Area	**Drugs processed in part by the protein**	**Medication Insights^**	**Therapeutic Recommendations^**
Cardiology	clopidogrel	Increased risk for adverse cardiovascular events.	Avoid standard dose (75 mg) clopidogrel if possible. Use prasugrel or ticagrelor at standard dose if no contraindication for cardiovascular indications. For neurovascular indications, consider an alternative P2Y12 inhibitor at standard dose if clinically indicated and no contraindication.
Gastroenterology	PPIs: omeprazole pantoprazole lansoprazole esomeprazole rabeprazole dexlansoprazole	Increased plasma concentration of PPI compared with CYP2C19 normal metabolisers; increased chance of efficacy and potentially toxicity.	Initiate standard starting daily dose. For chronic therapy (> 12 weeks) and efficacy achieved, consider 50%reduction in daily dose and monitor for continued efficacy.
Infectious Disease	voriconazole	Higher dose-adjusted trough concentrations of voriconazole compared with normal metabolisers.	Initiate therapy with recommended standard of care dosing.
Psychiatry	SSRIs: citalopram escitalopram sertraline	Reduced metabolism; when compared to normal metabolisers.	Initiate therapy with recommended starting dose.

^Medical Insights and Therapeutic Recommendation information are extracted from CPIC® guidelines.
PPIs = Proton pump inhibitors; SSRIs = Selective serotonin reuptake inhibitors.

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Genotyping by PCR - Drug Pharmacogenomics Test

Gene Test	Diplotype Detected*	Test Result
CYP2C19	*1/*17	Rapid metaboliser (Increased enzyme function) *See Page 2 for Medication Insights and CPIC® Therapeutic Recommendations*

**Allelic variants tested for CYP2C19:*
*2 (c.681G>A, rs4244285), *3 (c.636G>A, rs4986893), *17 (c.-806C>T, rs12248560).

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Medication Insights and Therapeutic Recommendations According to the CPIC®

Test Result (As in Page 1)	**Diplotype detected:** *1/*17 Rapid metaboliser (Increased enzyme function)

Therapeutic Area	**Drugs processed in part by the protein**	**Medication Insights^**	**Therapeutic Recommendations^**
Cardiology	clopidogrel	Decreased residual platelet aggregation.	If considering clopidogrel, use at standard dose (75 mg/day) for cardiovascular indications. No recommendation for neurovascular indications.
Gastroenterology	PPIs: omeprazole pantoprazole lansoprazole esomeprazole rabeprazole dexlansoprazole	Decreased plasma concentrations of PPIs compared with CYP2C19 normal metabolisers; increased risk of therapeutic failure.	Initiate standard starting daily dose. Consider increasing dose by 50–100% for the treatment of Helicobacter pylori infection and erosive esophagitis. Daily dose may be given in divided doses. Monitor for efficacy.
Infectious Disease	voriconazole	The probability of attainment of therapeutic concentrations is modest with standard dosing.	Choose an alternative agent that is not dependent on CYP2C19 metabolism as primary therapy in lieu of voriconazole. Such agents include isavuconazole, liposomal amphotericin B, and posaconazole.
Psychiatry	SSRIs: citalopram escitalopram sertraline	Lower plasma concentrations will increase probability of pharmacotherapy failure.	Consider an alternative drug not predominantly metabolized by CYP2C19. For Sertraline, initiate therapy with recommended starting dose. If patient does not respond to recommended maintenance dosing, consider alternative drug not predominantly metabolized by CYP2C19.

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PPIs = Proton pump inhibitors; SSRIs = Selective serotonin reuptake inhibitors.

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Genotyping by PCR - Drug Pharmacogenomics Test

Gene Test	Diplotype Detected*	Test Result
CYP2C19	*2/*2	Poor metaboliser (Decreased enzyme function) *See Page 2 for Medication Insights and CPIC® Therapeutic Recommendations*

**Allelic variants tested for CYP2C19:*
*2 (c.681G>A, rs4244285), *3 (c.636G>A, rs4986893), *17 (c.-806C>T, rs12248560).

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Medication Insights and Therapeutic Recommendations According to the CPIC®

Test Result (As in Page 1)	**Diplotype detected:** *2/*2 Poor metaboliser (Decreased enzyme function)

Therapeutic Area	**Drugs processed in part by the protein**	**Medication Insights^**	**Therapeutic Recommendations^**
Cardiology	clopidogrel	Increased residual platelet aggregation.	Avoid clopidogrel if possible. Use prasugrel or ticagrelor at standard dose if no contraindication for cardiovascular indications. For neurovascular indications, avoid clopidogrel if possible; consider an alternative P2Y12 inhibitor at standard dose if clinically indicated and no contraindication.
Gastroenterology	PPIs: omeprazole pantoprazole lansoprazole esomeprazole rabeprazole dexlansoprazole	Increased plasma concentration of PPI compared with CYP2C19 normal metabolisers; increased chance of efficacy and potentially toxicity.	Initiate standard starting daily dose. For chronic therapy (> 12 weeks) and efficacy achieved, consider 50% reduction in daily dose and monitor for continued efficacy.
Infectious Disease	voriconazole	Higher dose-adjusted trough concentrations of voriconazole and may increase probability of adverse events.	Choose an alternative agent that is not dependent on CYP2C19 metabolism as primary therapy in lieu of voriconazole. Such agents include isavuconazole, liposomal amphotericin B, and posaconazole. In the event that voriconazole is considered to be the most appropriate agent, based on clinical advice, for a patient with poor metabolizer genotype, voriconazole should be administered at a preferably lower than standard dosage with careful therapeutic drug monitoring.
Psychiatry	SSRIs: citalopram escitalopram sertraline	Greatly reduced metabolism; higher plasma concentrations may increase the probability of side effects.	Consider a 50% reduction of recommended starting dose and titrate to response or select alternative drug not predominantly metabolized by CYP2C19.

^Medical Insights and Therapeutic Recommendation information are extracted from CPIC® guidelines.
PPIs = Proton pump inhibitors; SSRIs = Selective serotonin reuptake inhibitors.

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Genotyping by PCR - Drug Pharmacogenomics Test

Gene Test	Diplotype Detected*	Test Result
CYP2C19	*2/*3	Poor metaboliser (Decreased enzyme function) *See Page 2 for Medication Insights and CPIC® Therapeutic Recommendations*

**Allelic variants tested for CYP2C19:*
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Test Result (As in Page 1)	**Diplotype detected:** *2/*3 Poor metaboliser (Decreased enzyme function)

Therapeutic Area	**Drugs processed in part by the protein**	**Medication Insights^**	**Therapeutic Recommendations^**
Cardiology	clopidogrel	Increased residual platelet aggregation.	Avoid clopidogrel if possible. Use prasugrel or ticagrelor at standard dose if no contraindication for cardiovascular indications. For neurovascular indications, avoid clopidogrel if possible; consider an alternative P2Y12 inhibitor at standard dose if clinically indicated and no contraindication.
Gastroenterology	PPIs: omeprazole pantoprazole lansoprazole esomeprazole rabeprazole dexlansoprazole	Increased plasma concentration of PPI compared with CYP2C19 normal metabolisers; increased chance of efficacy and potentially toxicity.	Initiate standard starting daily dose. For chronic therapy (> 12 weeks) and efficacy achieved, consider 50% reduction in daily dose and monitor for continued efficacy.
Infectious Disease	voriconazole	Higher dose-adjusted trough concentrations of voriconazole and may increase probability of adverse events.	Choose an alternative agent that is not dependent on CYP2C19 metabolism as primary therapy in lieu of voriconazole. Such agents include isavuconazole, liposomal amphotericin B, and posaconazole. In the event that voriconazole is considered to be the most appropriate agent, based on clinical advice, for a patient with poor metabolizer genotype, voriconazole should be administered at a preferably lower than standard dosage with careful therapeutic drug monitoring.
Psychiatry	SSRIs: citalopram escitalopram sertraline	Greatly reduced metabolism; higher plasma concentrations may increase the probability of side effects.	Consider a 50% reduction of recommended starting dose and titrate to response or select alternative drug not predominantly metabolized by CYP2C19.

^Medical Insights and Therapeutic Recommendation information are extracted from CPIC® guidelines.
PPIs = Proton pump inhibitors; SSRIs = Selective serotonin reuptake inhibitors.

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Genotyping by PCR - Drug Pharmacogenomics Test

Gene Test	Diplotype Detected*	Test Result
CYP2C19	*2/*17	Intermediate metaboliser (Decreased enzyme function) *See Page 2 for Medication Insights and CPIC® Therapeutic Recommendations*

**Allelic variants tested for CYP2C19:*
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Test Result (As in Page 1)	**Diplotype detected:** *2/*17 Intermediate metaboliser (Decreased enzyme function)

Therapeutic Area	**Drugs processed in part by the protein**	**Medication Insights^**	**Therapeutic Recommendations^**
Cardiology	clopidogrel	Increased risk for adverse cardiovascular events.	Avoid standard dose (75 mg) clopidogrel if possible. Use prasugrel or ticagrelor at standard dose if no contraindication for cardiovascular indications. For neurovascular indications, consider an alternative P2Y12 inhibitor at standard dose if clinically indicated and no contraindication.
Gastroenterology	PPIs: omeprazole pantoprazole lansoprazole esomeprazole rabeprazole dexlansoprazole	Increased plasma concentration of PPI compared with CYP2C19 normal metabolisers; increased chance of efficacy and potentially toxicity.	Initiate standard starting daily dose. For chronic therapy (> 12 weeks) and efficacy achieved, consider 50%reduction in daily dose and monitor for continued efficacy.
Infectious Disease	voriconazole	Higher dose-adjusted trough concentrations of voriconazole compared with normal metabolisers.	Initiate therapy with recommended standard of care dosing.
Psychiatry	SSRIs: citalopram escitalopram sertraline	Reduced metabolism; when compared to normal metabolisers.	Initiate therapy with recommended starting dose.

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Genotyping by PCR - Drug Pharmacogenomics Test

Gene Test	Diplotype Detected*	Test Result
CYP2C19	*3/*3	Poor metaboliser (Decreased enzyme function) *See Page 2 for Medication Insights and CPIC® Therapeutic Recommendations*

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Medication Insights and Therapeutic Recommendations According to the CPIC®

Test Result (As in Page 1)	**Diplotype detected:** *3/*3 Poor metaboliser (Decreased enzyme function)

Therapeutic Area	**Drugs processed in part by the protein**	**Medication Insights^**	**Therapeutic Recommendations^**
Cardiology	clopidogrel	Increased residual platelet aggregation.	Avoid clopidogrel if possible. Use prasugrel or ticagrelor at standard dose if no contraindication for cardiovascular indications. For neurovascular indications, avoid clopidogrel if possible; consider an alternative P2Y12 inhibitor at standard dose if clinically indicated and no contraindication.
Gastroenterology	PPIs: omeprazole pantoprazole lansoprazole esomeprazole rabeprazole dexlansoprazole	Increased plasma concentration of PPI compared with CYP2C19 normal metabolisers; increased chance of efficacy and potentially toxicity.	Initiate standard starting daily dose. For chronic therapy (> 12 weeks) and efficacy achieved, consider 50% reduction in daily dose and monitor for continued efficacy.
Infectious Disease	voriconazole	Higher dose-adjusted trough concentrations of voriconazole and may increase probability of adverse events.	Choose an alternative agent that is not dependent on CYP2C19 metabolism as primary therapy in lieu of voriconazole. Such agents include isavuconazole, liposomal amphotericin B, and posaconazole. In the event that voriconazole is considered to be the most appropriate agent, based on clinical advice, for a patient with poor metabolizer genotype, voriconazole should be administered at a preferably lower than standard dosage with careful therapeutic drug monitoring.
Psychiatry	SSRIs: citalopram escitalopram sertraline	Greatly reduced metabolism; higher plasma concentrations may increase the probability of side effects.	Consider a 50% reduction of recommended starting dose and titrate to response or select alternative drug not predominantly metabolized by CYP2C19.

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Genotyping by PCR - Drug Pharmacogenomics Test

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CYP2C19	*3/*17	Intermediate metaboliser (Decreased enzyme function) *See Page 2 for Medication Insights and CPIC® Therapeutic Recommendations*

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*2 (c.681G>A, rs4244285), *3 (c.636G>A, rs4986893), *17 (c.-806C>T, rs12248560).

Disclaimers:
This genotying test is a clinical test intended to provide genetic information to the healthcare provider to aid in the dose selection of drugs. CYP2C19 genetic variations detected under this test do not account for all of the variability in drug pharmacokinetics. This test is not intended as diagnostic, nor is it capable of being an advice on any specific problem or a recommendation for the prescription of any specific drug or a replacement thereof. The healthcare provider shall exercise professional judgement and careful interpretation of the test result in determining their advise to the patient and in the dose selection of drugs.

Verified By:	MR LOUIS ONG	<Title>
Approved By:	DR CHIEW YOKE FONG	Medical Director

ACUMEN DIAGNOSTICS PTE LTD.
Tel: 8339 8766 HCI: 20I0257
41 Science Park Road #01-02
Singapore 117610

Medication Insights and Therapeutic Recommendations According to the CPIC®

Test Result (As in Page 1)	**Diplotype detected:** *3/*17 Intermediate metaboliser (Decreased enzyme function)

Therapeutic Area	**Drugs processed in part by the protein**	**Medication Insights^**	**Therapeutic Recommendations^**
Cardiology	clopidogrel	Increased risk for adverse cardiovascular events.	Avoid standard dose (75 mg) clopidogrel if possible. Use prasugrel or ticagrelor at standard dose if no contraindication for cardiovascular indications. For neurovascular indications, consider an alternative P2Y12 inhibitor at standard dose if clinically indicated and no contraindication.
Gastroenterology	PPIs: omeprazole pantoprazole lansoprazole esomeprazole rabeprazole dexlansoprazole	Increased plasma concentration of PPI compared with CYP2C19 normal metabolisers; increased chance of efficacy and potentially toxicity.	Initiate standard starting daily dose. For chronic therapy (> 12 weeks) and efficacy achieved, consider 50%reduction in daily dose and monitor for continued efficacy.
Infectious Disease	voriconazole	Higher dose-adjusted trough concentrations of voriconazole compared with normal metabolisers.	Initiate therapy with recommended standard of care dosing.
Psychiatry	SSRIs: citalopram escitalopram sertraline	Reduced metabolism; when compared to normal metabolisers.	Initiate therapy with recommended starting dose.

^Medical Insights and Therapeutic Recommendation information are extracted from CPIC® guidelines.
PPIs = Proton pump inhibitors; SSRIs = Selective serotonin reuptake inhibitors.

Genotyping by PCR
Clinical Laboratory Report

ACUMEN DIAGNOSTICS PTE LTD.
Tel: 8339 8766 HCI: 20I0257
41 Science Park Road #01-02
Singapore 117610

Patient Name	MOCK		
NRIC/FIN No.	XXXXX999A		
Passport No.			
Nationality	SINGAPOREAN		
D.O.B.	01-JAN-1999		
Sex (M/F)	M		
Accession No.	MOCK	**Clinic / Hospital**	MOCK
Lab-Use ID	MOCK	**Ordering Doctor**	MOCK
Date of Sampling	DD-MMM-YYYY	**Date of Receipt**	DD-MMM-YYYY hh:mm:ss
Sample Type	Whole blood in EDTA tube	**Date of Results**	DD-MMM-YYYY hh:mm:ss

Genotyping by PCR - Drug Pharmacogenomics Test

Gene Test	Diplotype Detected*	Test Result
CYP2C19	*17/*17	Ultra-rapid metaboliser (Highly increased enzyme function) *See Page 2 for Medication Insights and CPIC® Therapeutic Recommendations*

**Allelic variants tested for CYP2C19:*
*2 (c.681G>A, rs4244285), *3 (c.636G>A, rs4986893), *17 (c.-806C>T, rs12248560).

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Verified By:	MR LOUIS ONG	<Title>
Approved By:	DR CHIEW YOKE FONG	Medical Director

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Medication Insights and Therapeutic Recommendations According to the CPIC®

Test Result (As in Page 1)	**Diplotype detected:** *17/*17 Ultra-rapid metaboliser (Highly increased enzyme function)

Therapeutic Area	**Drugs processed in part by the protein**	**Medication Insights^**	**Therapeutic Recommendations^**
Cardiology	clopidogrel	Decreased residual platelet aggregation.	If considering clopidogrel, use at standard dose (75 mg/day) for cardiovascular indications. No recommendation for neurovascular indications.
Gastroenterology	PPIs: omeprazole pantoprazole lansoprazole esomeprazole rabeprazole dexlansoprazole	Decreased plasma concentrations of PPIs compared with CYP2C19 normal metabolisers; increased risk of therapeutic failure.	Increase starting daily dose by 100%. Daily dose may be given in divided doses. Monitor for efficacy.
Infectious Disease	voriconazole	The probability of attainment of therapeutic concentrations is small with standard dosing.	Choose an alternative agent that is not dependent on CYP2C19 metabolism as primary therapy in lieu of voriconazole. Such agents include isavuconazole, liposomal amphotericin B, and posaconazole.
Psychiatry	SSRIs: citalopram escitalopram sertraline	Lower plasma concentrations will increase probability of pharmacotherapy failure.	Consider an alternative drug not predominantly metabolized by CYP2C19. For Sertraline, initiate therapy with recommended starting dose. If patient does not respond to recommended maintenance dosing, consider alternative drug not predominantly metabolized by CYP2C19.

^Medical Insights and Therapeutic Recommendation information are extracted from CPIC® guidelines.
PPIs = Proton pump inhibitors; SSRIs = Selective serotonin reuptake inhibitors.